FOR·THE·INCREASE·
AND·DIFFVSION·OF
KNOWLEDGE·AMONG·MEN·
PER
ORBEM
SMITHSONIAN·
INSTITVTION·
WASHINGTON·1846·

SHOUT
SHARE
IT

SMITHSONIAN INSTITUTION
UNITED STATES NATIONAL MUSEUM
BULLETIN 156

ABORIGINAL INDIAN POTTERY
OF THE
DOMINICAN REPUBLIC

BY

HERBERT W. KRIEGER
Curator of Ethnology, United States National Museum

UNITED STATES
GOVERNMENT PRINTING OFFICE
WASHINGTON : 1931

For sale by the Superintendent of Documents, Washington, D. C. - - - - Price, 75 cents

ADVERTISEMENT

The scientific publications of the National Museum include two series, known, respectively, as *Proceedings* and *Bulletins*.

The *Proceedings*, begun in 1878, are intended primarily as a medium for the publication of original papers, based on the collections of the National Museum, that set forth newly acquired facts in biology, anthropology, and geology, with descriptions of new forms and revisions of limited groups. Copies of each paper, in pamphlet form, are distributed as published to libraries and scientific organizations and to specialists and others interested in the different subjects. The dates at which these separate papers are published are recorded in the table of contents of each of the volumes.

The *Bulletins*, the first of which was issued in 1875, consist of a series of separate publications comprising monographs of large zoological groups and other general systematic treatises (occasionally in several volumes), faunal works, reports of expeditions, catalogues of type-specimens, special collections, and other material of a similar nature. The majority of the volumes are octavo in size, but a quarto size has been adopted in a few instances in which large plates were regarded as indispensable. In the *Bulletin* series appear volumes under the heading *Contributions from the United States National Herbarium*, in octavo form, published by the National Museum since 1902, which contain papers relating to the botanical collections of the Museum.

The present work forms No. 156 of the *Bulletin* series.

ALEXANDER WETMORE,
Assistant Secretary, Smithsonian Institution.

WASHINGTON, D. C., *April, 1931.*

CONTENTS

	Page
Introduction	1
Geography	11
Native tribes and provinces	16
Nonagricultural cave dwellers	20
Historical narratives and archeological field work	22
Source material to the ethnology of Santo Domingo	22
Archeological explorations prior to 1928	24
Field work in Samana Province, 1928	27
Field work in Monte Cristi Province, 1929	35
Field work in La Vega, Azua, and Santo Domingo Provinces, 1930	38
Elements of form and design in Santo Domingan aboriginal pottery	47
Details of construction and design	61
Description of type examples in the national collection	63
Subareas of aboriginal pottery in Santo Domingo	63
Samana pottery types	74
Pottery from the Samana caves	74
San Juan pottery types	76
Pottery stamps and miscellaneous objects	79
Crosshatching and stone-collar decorative designs	83
Rattles	83
Clay figurine heads	84
Modeling of life forms	85
Water bottles	88
Vases and censers	93
Pottery pestles	95
Bowls	97
Northern affiliations of Santo Domingan pottery	104
Characterization of divergent pottery groups in the Antilles	120
Aboriginal pottery of the Bahamas	120
Aboriginal pottery of Cuba	121
Jamaican aboriginal earthenware	122
Prehistoric earthenware of the Virgin Islands	123
Prehistoric pottery of the Lesser Antilles	125
Trinidad and South American earthenware types	126
Conclusion	138
Index	141
Explanation of plates	153

ABORIGINAL INDIAN POTTERY OF THE DOMINICAN REPUBLIC

By Herbert W. Krieger
Curator of Ethnology, United States National Museum

INTRODUCTION

The Dominican Republic includes the eastern two-thirds of the island known as Santo Domingo or Haiti, the black Republic of Haiti occupying the western third of the island. The Arawak aborigines named the island Haiti or Aiti, a name also applied to a mountainous section of the Province of Higuey. Later, when Columbus cast about for a suitable name, he called the island Española. This name was later corrupted into Hispaniola, a term still in vogue, although geographical practice is to again employ the aboriginal name Haiti when referring to the geographical aspects of the island, but to refer to the island as Santo Domingo in connection with its eastern portion, exclusive of the western third which is occupied by the Haitians. The name Santo Domingo, originally applied to the present capital city of the Dominican Republic, gradually came to signify the countryside as well, although the term is now obsolescent except as the name of the Dominican capital city.

The Dominican population in the cities is almost purely Spanish, although the laboring classes show admixture with African strains. Hybridization is more marked in the provinces, particularly in Samana and along the Haitian border. Isolated agricultural communities in the cacao-growing districts of the Vega (great meadow) in the valley of the Yuna River, also in the coffee-growing sections in the uplands of the interior, in the Provinces of Santiago, La Vega, Azua, Espaillat, and Monte Cristi, are descendants from Spanish immigrants, colonists, and soldiers of the royal armies of Spain. Traces of Indian blood may be seen in some of the interior villages of Samana, Monte Cristi, and other provinces, where isolated communities have perpetuated themselves through the centuries of political change and turmoil that disturbed the more populous

centers. The conuco, or small cleared space in the forest, still forms the mainstay of native Dominican agriculture except on the sugar estates of the south coast.

During the interval of his second voyage Columbus began the practice of sending natives of Santo Domingo to Spain to be sold into slavery. Tribute was exacted from the remainder. The tribute levied was to be in gold, but an arroba of cotton was later substituted as the quarterly tribute levied upon all adults over 14 years of age. As cotton was not grown throughout the island, and as it was practically impossible to obtain gold elsewhere except in the central mountains of Cibao, service was accepted instead of gold or cotton. This was in the year 1496 and was the beginning of the repartimiento, later to be expanded into the encomienda system, under which natives of the conquered island were divided among the Spanish soldiery for administrative purposes, principally for the collecting of tribute. Under this arrangement the Indian population of the island rapidly decreased. Thus, of the several Indian "caciques" governing native provinces or geographical districts at the time of the conquest practically all met with a premature death because of their European conquerors. Caonabo died a captive on shipboard; Guarionex died likewise a captive on a Spanish vessel; the "queen" Anacaona was hanged, as was also Cotabanama. Goacanagaric died, like his friend Columbus, of a broken heart.

Within historic times the aboriginal population of the West Indies has included two great linguistic stocks—the Carib and the Arawak. The Arawak population of the Greater Antilles and of the Bahamas was known to the Spanish explorers as a peaceful agricultural people rapidly giving way before aggressive bands of Caribs from the Lesser Antilles. In St. Vincent, Martinique, Dominica, Guadeloupe, and elsewhere Columbus encountered the Carib, but heard from widely separated groups of Arawak about the raids and depredations of roving Carib bands.

The material culture of the Arawak Indians of Santo Domingo is South American in origin, and in a general way, in content. Relationship is with the agricultural peoples of the tropical lowlands of the Guiana and Venezuelan coasts. It is in agriculture that the essential South American culture elements reappear throughout the native provinces of Santo Domingo. The Samana aborigines maintained that they had originally occupied caves in the island but that some of their number had come from another island, supposedly Martinique, in canoes. This bit of Arawak folklore must be taken for what it is worth in connection with corroborative evidence of archeology. No Arawak group was found living in caves in the island of Santo Domingo at the time of the conquest, neither were there Arawak settlements in any of the Lesser Antilles at that time.

Antillean tribes had retained or borrowed the elements of cassava culture from tribes of southeastern South America, where it continues to be characteristic of the area. Making of bread from the cassava plant (*Manihot edulis*) and the making of vinegar from its juices, used as a seasoning for the pepper pot, was introduced from South America. In the West Indies the culture of cassava was subjected to environmental conditions and changes. The fact that cassava and not maize was the principal food of the aboriginal population of Santo Domingo is significant of the antiquity of South American culture influence and likewise of the relative freedom from Mexican and Gulf State culture origins.

Pottery was brought to the islands and there developed into artistic forms not known in the pristine home of the island Arawak. This development may apparently be ascribed to the delimiting influence of a new environment and also to cultural tendencies within the circumscribed island archipelago. Stoneworking became especially developed in Porto Rico and Santo Domingo and in certain islands of the Lesser Antilles, but this art appears not to spring from any South American focus of Arawak or Carib influence, nor did its intensity of development persist up to the time of the Spanish conquest. It is rather a special growth affiliated with Mexican and Central American art. The Carib-Arawak of the Guianas and of other parts of South America remain in a prestone age grade of culture peculiar to the tropical forest and savanna tribes of South America. The West Indies are not repressive areas like the overpowering forests of South America, but include drier areas where agriculture is practiced to advantage. The practice of irrigation in the western part of the island presupposes a high development of primitive agriculture.

The chief culture bearers in eastern South America were the Arawak and perhaps also the Carib. At the time of the Spanish conquest they occupied the Guianas and Venezuela in part, also portions of Brazil and of Colombia. Ceramic remains from the deltas of the Parana in Argentina and from the island of Marajo in the delta of the Amazon are ascribable to the early Arawak, whose influence in South American culture has not yet been fully determined. The ancient characteristics of Arawak ceramic form and design such as are found in quantity throughout the Antilles but modified by local technical developments may be found as characteristic features of other ancient cultures only in what are unmistakably old sites in Panama, Venezuela, Brazil, and the Guianas. Such elements of form include shallow spherical or narrow globular bowls, with incurved, outcurved, or straight rims and decorated with an encircling panel of geometric incised patterns with modeled figurine heads added to the outer wall of the vessel near the lip.

None of the wide variations in form and decorative design characteristic of the intensive centers of pottery development in Central America and in the Mississippi Valley, or of the more recent painted designs characteristic of lowland South America and of Andean areas are to be found in this ancient Arawak culture center.

Within the Greater Antilles was the strengthening bond of a common speech. Columbus observed that the Arawak speech was understood as far west as Pinar del Rio Province in Cuba, as far north as the Bahamas, where it was the common speech, and as far east as the Carib islands of Dominica and Guadeloupe. He also discovered that the natives of Cumana and of Paria, on the Venezuelan coast, knew of the existence of the islands of Haiti and Porto Rico, although they spoke a different language. Las Casas writes that one type of custom prevailed throughout the island of Santo Domingo. Although local dialects were noted, notably that of the Ciguayans of Samana, this did not interfere with their being understood to considerable extent by natives throughout the entire West Indian archipelago with the exception of the Caribs of the Lesser Antilles, but even here the many captive Arawak women preserved a knowledge of their language. The son of Goacanagaric, cacique of Marien on the north coast of Haiti, easily conversed with native women from Porto Rico (Borinquen) who had been rescued from the Caribs by Columbus.

Daniel G. Brinton [1] was the first to demonstrate that the primitive language of Cuba was identical with that of the Arawak stock. He first published his discovery in the Transactions of the American Philosophical Society for 1871.

It had formerly been supposed that the Tupi stock, of Brazil, or the Maya, or even the Canary Island stock language, had been that of the aborigines of Santo Domingo, Haiti, and Cuba. This thesis is advanced by Antonio Bachiller y Morales in his Cuba Primitiva. Brinton also remarks that it was from the natives of the extreme western province of Pinar del Rio that Spaniards first heard of the Mayan and Aztecan civilizations. The most frequently cited example of Yucatec influence in Cuba, namely, the presence in Cuba of beeswax supposedly brought there by traders from Yucatan, is of little significance. We know of no other trade objects from that source.

Some writers have derived the insular Caribs from a South American stock on the ground of linguistic affinities. And it is yet to be shown whether the differentiation of insular Carib linguistics occurred before or after their ancestors left South America. Im Thurn has derived the Guiana Caribs from those of the Lesser Antilles.

[1] The Archeology of Cuba. Amer. Archeol., vol. 2, pt. 10, pp. 253–256, October, 1898.

The designation Carib, according to Oviedo, is an Arawak word meaning a warlike people, but not a distinct race. Doctor Chanca wrote that the Caribs occupied three of the Antilles, Guadeloupe, Dominica, and St. Croix. Apparently there were no Caribs on the island of Trinidad at the time of the discovery.

Columbus was responsible for the statement that native barter extended throughout the archipelago and included stools, gold, dishes, pottery of diverse forms, and carved objects. The wares that the Arawak of Cuba wished to barter with the Spanish consisted of food and provisions, cotton, yarns in balls, and parrots. With the Spanish, the Arawak of Santo Domingo wished to barter for glass beads, brass bells, pins, laces, and glazed dishes from Spain.

Columbus found on the north coast of Haiti in 1492 two varieties of pottery in Marien, in the Bahia de Acul. Indians brought water to the ships in "cantarillos de barro," also small vessels for the Haitian maize soup. Herrera speaks of their "earthenware pitchers, handsomely made and painted." According to Benzoni, the cacique's bread was baked in a round pipkin, and they also used large jars or vases and pipkins in the manufacture of their wine[2]; he also refers to their idols being made of clay.[3] Angleria mentions special pots for cooking iguanas. Anacaona presented to the Adelantado 14 seats and 60 earthenware vessels for the kitchen, besides 4 rolls of woven cotton of "immense" weight.

A final statement regarding the northern and southern affiliations of aboriginal earthenware forms and designs from Santo Domingo would be premature until the several pottery subareas of eastern United States and of Venezuela, the Guianas, Brazil, Panama, and Colombia have been chronologically defined and described. Although the number of specimens in collections from the islands of the Lesser Antilles lying between Trinidad and the Virgin Islands is small, detailed descriptions are available, and the area has been studied by Fewkes, De Booy, Hatt, and others so far as the limited archeological data for the area permits. The relation of Arawak and Carib pottery in the Lesser Antilles, especially with regard to chronological sequence and distribution, remains undetermined; as does also the relation between Carib wares and the red and polychrome ware of southwestern Porto Rico on the one hand and the slipped red ware of southeastern Santo Domingo on the other.

Several representative aboriginal pottery collections from the Greater Antilles exist in the great museums of the United States and Europe. In the United States the collections of Santo Domingan aboriginal pottery of the Museum of the American Indian,

[2] Benzoni, Girolamo, History of the New World, showing his travels in America, from A. D. 1541 to 1556. Printed for the Hakluyt Society, London, 1857, p. 86.

[3] Idem., p. 78.

Heye Foundation; the American Museum of Natural History; the Peabody Museum; and the United States National Museum are outstanding. In the United States, Thomas Howell, of New York, possesses perhaps the largest private collection of aboriginal earthenware objects from Santo Domingo.

In the Dominican Republic the pottery collections of Mr. Sanborn, of the Monte Llano Sugar Estate, Puerto Plata, and of Señor Andres Socias, of Copey, Province of Monte Cristi, are extensive; while the Dominican National Museum has perhaps the largest collection of unbroken earthenware vessels from any one site in the West Indies. Many of the examples of aboriginal ceramic wares in the collections mentioned come from the Arawak Indian cemetery at Andres, a narrow sand spit projecting into the Bahia de Andres on the Caribbean near the Dominican town of Boca Chica, about 25 kilometers east of the capital city of Santo Domingo, and directly fronting the sugar warehouses of the Compañía Azucarera Boca Chica and the adjoining Dominican village of Andres. The Dominican National Museum also houses the large collection formerly exhibited in the municipal building at Santiago de los Caballeros and collected from mormer Indian village sites in the adjoining provinces of Santiago, Puerto Plata, and La Vega.

The Santo Domingo pottery collection in the British Museum, also smaller collections in continental museums at Berlin, Paris, and Copenhagen, have been studied by Fewkes, Joyce, and others. Smaller collections exist in other European museums, but the total number of known examples of aboriginal earthenware from Santo Domingo, considering its importance as an archeological center of pottery manufacture, is small.

Santo Domingan aboriginal pottery, as represented in the collections mentioned, belongs to a single culture area—form, paste, surface finish, decorative design, and details of style set it apart as distinct from Cuban, Jamaican, and to a certain extent from Porto Rican aboriginal pottery wares; pottery fragments left by some earlier or immigrant non-Arawak people being nonexistent in Santo Domingan middens. The decorated pottery wares from every known aboriginal site in Santo Domingo are unquestionably one in type; that is, there is a stability in all the features making up the different proportions and characters in the four primary elements of ceramic material, namely, paste, surface finish, form, and design. The undecorated ceramic forms from cave sites and from the mountainous interior of Santo Domingo offer some material for controversy as to their indentity in type with the typical Tainan or Arawak ceramic wares. To offset this, however, is the deposition in middens of Monte Cristi Province of similar crude, undecorated

pottery and utensils of conch shell (*Strombus gigas*) with artifacts and skeletal remains undoubtedly Arawakan. If we could point to a definite stratigraphy in the cave deposits of Samana Province with this undecorated pottery at the bottom in association with burials of undeformed crania and with Arawakan artifacts at the top, our problem would be solved in a different way and we should accept Harrington's Cuban Ciboney as having likewise produced ceramic forms in Santo Domingo. Nowhere do we find such stratification, however. In all the cave deposits of Samana and La Vega Provinces investigated by the writer potsherds were found but rarely and when found were typically Arawakan in form or detail of decorative design. The flat-bottomed, shallow bowl "cazuela" with its thick and heavy walls offering no decorative design for identification is occasionally uncovered in the central cordillera of the island in La Vega Province along with rock ledge burials of Arawak with deformed crania. The writer obtained two such examples of flat-bottomed, heavy-walled shallow food bowls—one in a cave, the other in a rock ledge burial in the mountains adjoining the valley of the Limoncilla, near Constanza, each accompanied by Arawakan artifacts; one also by a skull showing frontal-occipital deformation.

Methods applied in determining the elements of Santo Domingan ceramics as typified in finds from the Provinces of Samana, Monte Cristi, La Vega, and Santo Domingo may here be summarized. With the exception of the "cazuela" examples accompanying rock ledge burials, also with the exception of the numerous earthenware vessels of varied description excavated from the Arawak cemetery at Andres, Province of Santo Domingo, on the Caribbean coast, most of the examples of Santo Domingan aboriginal ceramics are from the open village sites and consist principally of shards. The earthenware vessels obtained from the cemetery at Andres are from a depth of from 3 to 8 feet and are for the most part intact.

In describing the wares of Santo Domingan pottery areas or subareas the writer follows a scheme somewhat as follows: The primary characteristics of ceramic material, namely, the paste, the form, the surface finish or polish, and the decorative design, if any, gives us a conception of the type. The type of ceramics is clearly indicated when we have stability in each of the four primary characteristics of ceramic material. Type is considered distinctive from a ware in which all of the elements of the paste and surface finish are more or less constant. We are also able to distinguish by comparative method the so-called style of a ware or of a type by the presence of some outstanding feature. In the case of earthenware from Santo Domingo the style is characterized by combined

incised and applied decorative design or by the presence of figurine heads representing animals and used as decorative lugs or handles on earthenware vessels. Types of Antillean ceramics are recognizable through the similarity in paste, form, surface finish, and decoration, while the style is indicated by a superficial similarity only, principally in the manner of applying decorative design. For example, the modeled figurine head is either luted on to or is itself a part of the walls of the vessel; or, again, zoomorphic figurines appear to gaze into the vessel or peer outward or sidewise.

Paste indicates the composition of the clay and a clear-cut, accurate description of the paste is possible only with the aid of a chemical analysis. In this description of West Indian pottery no such analysis has been attempted. The writer analyzed the tempering material of stone and shell employed in the Santo Domingan pottery forms examined, both as to its relative quantity and coarseness, each of which is an aid in determining the composition of the paste. The texture of the paste was studied chiefly from the standpoint of its fineness and the thoroughness of its treatment by the primitive potter. Firing and degree of hardness due to heat were tested to determine resistance of the pottery to scratching. The relative thickness of the unfired area occupying the center of wall is perhaps a superior indication of degree of firing and skill of potter. The Samana examples were tested by the ability of the paste to absorb small quantities of water.

The color of the unslipped paste, due to its composition and to the firing, shows a variegation in color of red, gray, and black to various shades of buff. The surface finish principally of the Andres and Monte Cristi examples shows more evidence of smoothing and polishing than it does of application of slips or washes. When such washes are applied they are never mineral of the type that has been designated as lead, alkaline, or feldspathic, neither is there any indication of the use of such substances as wax, oil, or the gum of certain trees. A white clay slip, kaolin, had been applied perhaps more than any other form of slip. Much of the patination and unfortunately much of the reddish colored slip was removed along with organic material adhering to the walls of the Monte Cristi and Andres vessels when they were cleansed in a dilute solution of hydrochloric acid. A discoloration or patination of the surface due to inhumation, weathering, flaking, or other processes of disintegration was particularly evident in the Andres pottery.

The third primary element or characteristic in this study of ceramics, that of decoration, hinges on the design intended and the technic. The processes of application are three, (1) incising, etching or engraving, and stamping as contrasted (2) with the coiling

of clay ribbons applied in the form of the conventional art of the area and (3) in the application of paints or slips. There is no question in West Indian pottery as in the Titicacan ware of Peru as to glazed surfaces or of the incrustation of shells, bits of wood, or other extraneous materials.

The form of earthenware vessels, figurines, and other utilitarian objects in clay affords a more satisfactory criterion for comparison with subareas in eastern Indian ceramics than does decorative design, which elsewhere with its various elements and motifs usually constitutes a superior means of pointing the way in pottery classification. Methods employed in producing pottery forms are simplified in the West Indian area because there is no question there of the use of molds and but rarely of stamps and of roulette decoration; most examples of decorative embellishment being produced by free-hand, even to the details of decorative design, the use of a sharp stick, fragment of gourd, or of the fingers of the hand, occasionally of some stamp pattern being indicated.

In discussing form there are four things to be considered: The shape of the body of the vessel; the shape and relation of the paste to this body; the presence or lack of an oral sector with a definite or poorly defined neck and margin; and lack of annular rings, free standing legs, applied looped handles, and other applied features. Measurements given in this paper are of the maximum dimensions of the vessel as to height, diameter, or applied secondary features, also of the walls in cross section. We may roughly speak of thick, medium, and thin-walled earthenware vessels in describing Santo Domingan ceramics, but it is necessary to know what constitutes the average thickness of each ware before such statement has any meaning. This varies between one-fourth and one-eighth of an inch.

The general lack of effigy vessels is to be noted; perhaps a better, rough classification being that of utilitarian and ceremonial wares, with very few examples of the latter present in any collection. For instance, but one or two known examples of the brazier exist. Perhaps the greatest departure from the ordinary container in Santo Domingan aboriginal earthenware vessels is found in the more specialized water bottles; each of its several secondary features being in a class by itself, and not found elsewhere in contiguous centers of pottery production.

In contrasting West Indian pottery with that of the more distant high cultures in Mexico, Peru, or Colombia, one notes at once in the former the lack of ceremonial or cult vessels. When such earthenware receptacles do exist in the Antilles their shape, construction, and decoration are similar to those of the domestic or utilitarian ceramic forms.

The study of the methods of construction of the walls of a vessel has for purposes of comparison less value than a study of the surface finish, for the reason that coiling methods were widely extended in America and in Africa from ancient times. If we were forced to rely alone on methods of wall construction, that is, whether coiled or cut from the solid, it would be impossible in the West Indies to distinguish between modern Haitian forms and aboriginal ceramics. A study of methods of tempering practiced by different peoples is of greater value because of the wide range of materials used in tempering, which differ usually from area to area, as tempering with shell in aboriginal Florida but with crushed rock particles in Santo Domingo.

Such objects as lime, mica, sand, ashes, bits of crushed rock or rounded pebbles, and bits of broken shell are used by different American tribes, the strangest tempering material perhaps being that used by the Eskimo of western Alaska, namely, seal blood and hair. It is impossible to make pottery from certain durable clays that occur in pure form without the use of tempering matter. This discovery was made at an early time and contributed to the development of pottery. In one of the oldest areas of culture development, the Mesopotamian-Egyptian culture area, we find at an early date clay bricks made with a tempering material of chopped straw. Chinese bricks likewise depend for durability on this addition of chopped straw to relieve unequal stress which develops in the hardening of the clay during firing. Without such addition all pottery from pure clay would crack from unequal stress. The modern Mexican potter does not employ a tempering material because he finds it unnecessary owing to the homogeneous clays that he uses in his art. Some of the aboriginal earthenware from coastal villages in eastern Santo Domingo likewise show no extraneous tempering material due to the presence of sand in large quantities in the clay. Elsewhere in Santo Domingo the aboriginal potter added bits of broken steatite, pebbles, potsherds, and occasionally even bits of charred wood, as a temper.

Another interesting phase in the manufacture of ceramics having value for comparative purposes is the color. Color in earthenware forms is always due to the presence of iron or the form in which iron occurs. If iron occurs in the form of carbonate it burns to a red oxide. With silicate of iron present the earthenware burns to a creamy color. These two outstanding colors of wares, that is, gray ware and red ware, are the characteristic colors of unpainted earthenware forms in aboriginal Santo Domingo, the clays that burn to a red oxide occurring near the surface while the creamy colored ware or gray ware is derived from clays obtained from a depth of 3 and sometimes 6 or more feet. A characteristic form of earth used in making pottery of a very porous and coarse texture

is the black loamy soil of creek bottom lands naturally tempered with sand and pebbles. This paste is used in the aboriginal Dominican pottery as it occurs, without the addition of a tempering material. When fired it burns to a salmon color. It is often impossible to determine whether the vessel presents a surface coloring due to burnishing, tooling, application of a thin slip, or whether it is a natural color produced by firing. The presence of a thick slip is much more readily detected, but is of rare occurrence even in the centers of diversified pottery forms in southeastern Santo Domingo.

The development of molds in shaping the walls of the vessel apparently never was arrived at by the Santo Domingan potter, although use of clay molds was a common practice in the highland cultures of Central and South America, even the applied decorative figurine heads being made by free-hand in the postarchaic Antillean pottery as were practically all of the incised decorative elements. An occasional regularity of applied or incised decoration resembling trailing shows that etching tools of complex design were employed by the Santo Domingan potter, but not nearly so frequently as in the southern Gulf States. A few examples of fragmentary vessels showing the use of a crosshatch paddle stamp were recovered in 1928 in Samana Peninsula. It is possible that more such examples exist, as the practice is rather widespread and of sporadic occurrence throughout America.

The last step in the production of aboriginal earthenware forms, the firing, is important in determining hardness of walls and color of unpainted surfaces. Black ware was produced by smothering the fire with leaves or green twigs and then covering the kiln with ashes. This ware is found chiefly in Monte Cristi and in the mountainous interior, less in the eastern Provinces of Samana and Santo Domingo. Normally earthenware vessels were burned in the open, a fire built around the vessel sufficing. Slow cooling was effected by means of smothering the fire gradually with earth. Pits and kilns were used by the aborigines in Colombia, but aside from a few pits of unknown use in isolated sections of Santo Domingo, nothing in the aboriginal ceramics of Santo Domingo indicates the use of kilns in that pottery-making area.

GEOGRAPHY

The West Indian Archipelago extends from Florida Peninsula, a consolidated limestone formation devoid of relief features, to the continental area of South America, a distance of 1,600 miles. The Bahama Islands, anciently known to the aboriginal Arawak population as the Lucayas, are likewise of a low-lying coralline formation like that of Florida, which is but 60 miles distant from the nearest island of the group.

On the south the large continental mass of South America approaches nearest to the island archipelago along the Venezuelan coast. Some of the islands known as the Lesser Antilles, namely Grenada and Tobago, are but 80 miles off the Venezuelan coast, which is in part inclosed by the large island of Trinidad. Point Galera on the island of Trinidad is separated from Tobago, of the Lesser Antilles, by only 25 miles of water. The entire area surrounding the delta of the Orinoco is now and in pre-Columbian times probably had been occupied by the Warrau, a coast tribe related linguistically neither to the Carib nor to the Arawak Indians, who occupy the Guiana coast of South America southeast of Venezuela. A division of the Arawak also occupied the most northerly peninsula of Colombia just west of the Gulf of Maracaibo, where they lived in striking distance of the ancient Chibcha of the upper Magdalena River Valley. It is significant that this most northerly Arawak division lived just 300 miles directly south of Beata Island off the south coast of Santo Domingo. It is also significant that prehistoric pottery figurines and decorative details from the coast of the Gulf of Darien are more closely related to those of Santo Domingo than are those from ancient sites on the Orinoco and Amazon Rivers.

The delta of the Orinoco River empties itself into the Gulf of Paria on the Venezuelan coast. The great Orinoco discharges its water into the Gulf of Paria and elsewhere along the coast through 20 distributaries covering 160 miles of South American coast directly facing the Lesser Antillean Islands. It is, therefore, probable that a canoe culture developed by the coast Arawak and Carib groups of northern South America reached the Greater Antilles by way of northern and the smaller outlying islands of the Lesser Antilles. Dislodged groups followed the outgoing current of the Orinoco in their dugout canoes, paddled their way along the leeward side of the island chain, and gradually approached the large islands of Porto Rico, Haiti, Cuba, and Jamaica. In this northwestward migration wind and ocean currents were favorable factors.[4] A more direct approach from the vicinity of the Gulf of Maracaibo by way of the Dutch islands of Curaçao and Aruba northward to the southern coast of Santo Domingo is not impossible for a primitive folk skilled, as were the Arawaks, in ocean travel. Identity in the cultural remains from the islands mentioned and from Santo Domingo make this possibility highly probable. This supposition is here advanced as it has the advantage of favorable wind and ocean currents.

[4] The physical basis of prehistoric tribal and culture migrations in the West Indies has been carefully studied by Adolfo de Hostos in a work entitled "Notes on West Indian Hydrography in Its Relation to Prehistoric Migrations," Twentieth Congr. Int. Americanistas, p. 239, Rio de Janeiro, 1924.

The northeast trades blow so constantly that each of the Lesser Antilles has two climatic regions, the windward and the leeward. The direction of ocean currents has brought it about that, biologically, the islands are connected with South America, and we may suppose the original peopling of the majority of them was from that continent. The great river, Orinoco, which discharges a volume of fresh water sufficient to render the Gulf of Paria, Venezuela, brackish, has had an important influence on the migration of plants and animals. Drifting logs that have floated from its delta to Barbados have no doubt carried reptiles, insects, seeds, and even higher mammals. Paddles from Indian tribes dwelling in the Orinoco delta are from time to time found on the east coast of Trinidad. But in the Greater Antilles, as Cuba, it is different; there the ocean currents set from the west, eastward, rendering these islands biologically allied to Central America rather than to South America. The peopling of islands by man in early colonization follows much the same laws as that of plants and animals.

Columbus found a different tribe, the Caribs, possessing a distinct language and an entirely different culture, occupying the Lesser Antilles. He observed what he thought unmistakable evidence of cannibalistic practices at Guadeloupe and Dominica on his arrival in the West Indies during his second voyage. What he observed and thought to be cannibalism may in truth have been endocannibalism, a much more likely explanation. He thought he had discovered representatives of the same cannibalistic Caribs at Samana during his first voyage. In this, of course, Columbus was in error. His fantasy and imagination distorted his vision and many of his observations must be disinterestedly checked with data that have not suffered by his zeal for discovery.

The islands of the Lesser Antilles are of marine formation, or, as is the case of Grenada and Dominica, are volcanic in origin. Peaks of an elevation sufficiently great to make them visible at a distance of many miles were landmarks to the aboriginal sailor. Gaps between islands of the Lesser Antilles are many; one, between Sombrero and Anegada Islands, is about 50 miles wide. Mona Passage, separating Porto Rico from Santo Domingo, is 64 miles wide but is divided in mid-channel by Mona Island, which affords a shelter, though barren and inconvenient. As late as the sixteenth century, Arawak sailors traversed this passage. The same is said for the Florida boatmen of the sixteenth century, who regularly traveled from the Florida keys to Havana, long after the arrival of the Spanish in the New World.

The West Indian Archipelago in recent times has undergone subsidence, although recent uplifted strata extending over limited

areas are marked by continuous ocean cutting. This is particularly applicable to eastern provinces of the island of Santo Domingo. The land mass extending from Cuba to the Virgin Islands is now submerged in part, but is still represented by the islands of Cuba, Santo Domingo, and Porto Rico. A central axial mountain range traverses the islands and reaches its highest elevation in the Province of La Vega in the watersheds surrounding the valley of Constanza. The negative influence of environment may be noted in the identity of cultural finds from kitchen middens of this upland valley with midden deposits from habitation sites at much lower elevations. There is, to be sure, at archeological stations far removed from the sea, a lack of shell deposits of mollusks such as conchs, clams, also of fish and of turtle bones; but in the essentials of the Arawak culture pattern an identity is preserved between archeological stations of the coast and of the mountainous interior. In Santo Domingo the axial cordillera includes perhaps two-thirds of the entire land mass. Another range paralleling the central cordillera on the north extends from the north coast of Haiti near the mouth of the Yaque River to the eastern boundary of the island, sending a spur throughout the length of Samana Peninsula far to the east. This peninsula is a mass of irregular mountain ridges and spurs with a small fringe of lowlands along the coast.

The topographic divisions included in the Dominican Republic [5] are the northern mountain range, the Cordillera Septentrional; Samana Peninsula; on the northeast Cibao Valley, the great central plain or meadow (vega); the Cordillera Central; the Valley of San Juan; the Azua Plain; Sierra de Neiba; Sierra de Martin Garcia; Enriquillo Basin; Sierra de Bahoruco; southern peninsula of Barahona Province; and the southern coastal plain.

The Cordillera Septentrional or northern mountain system, also called the Monte Cristi Range, starts as low, rounded, rocky hills near Monte Cristi, extends southeastward for about 200 kilometers parallel to the northern coast, and terminates near the shore of Bahia Escocesa. It includes a few isolated mountain masses such as the Silla de Caballo, or Saddle Mountains, near Monte Cristi.

The highest mountains of the northern range are in the west, north of Santiago, where some of the peaks attain altitudes of 1,000 or more meters above sea level.

The western part of the Monte Cristi Range is very irregular. Isolated, rounded rocky hills, 60 meters or more high, rise abruptly from a rolling plain which averages little more than 10 meters above sea level. El Morro de Monte Cristi is a narrow, wedge-shaped out-

[5] Vaughan, T. W., Cooke, Wythe, Condit, D. D., Ross, C. R., Woodring, W. P., and Calkins, F. C., A Geological Reconnaissance of the Dominican Republic. Dominican Republic Geol. Surv. Mem., vol. 1, 1921.

lier about 225 meters high. It is separated from the mainland by salt marshes.

Monte Isabel de Torres rises steeply almost from the water's edge at Puerto Plata on the north coast to an altitude of 815 meters above sea level and is a conspicuous landmark, usually swathed in clouds. In the area surrounding Puerto Plata the mountains lie back from the shore, and the area between them and the sea is hilly and rolling. This region was repeatedly traversed by Dr. W. L. Abbott in the course of his natural history investigations. Several archeological specimens were collected by him from caves located in these mountains.

Samana Peninsula has rugged but not very high mountains. It projects about 50 kilometers eastward from the northeast corner of the main island mass. Its average width from north to south is less than 12 kilometers. The west end of Samana Peninsula is separated from the mainland by a flat swampy area, the Gran Estero, which is in process of being closed, partly by uplift of the land and partly by filling in with silt brought down by the Rio Yuna.

The Cibao Valley, lying between the northern and central mountains, extends from Manzanillo Bay and Monte Cristi eastward to Samana Bay, a distance of about 225 kilometers. It ranges in width from about 15 to 45 kilometers. In the vicinity of Santiago this great valley is divided by a low, hilly watershed into two nearly equal parts.

The western half of the Cibao Valley is drained by the Rio Yaque del Norte, which flows northwestward into Manzanillo Bay. Most of the country here is rolling and open, and the streams in it are deeply intrenched below the general level. The greater part of the west end of the Cibao Valley is occupied by the broad delta and flood plain of Rio Yaque; farther upstream the flood plain narrows and finally disappears.

The eastern half of the Cibao Valley is drained by the Rio Yuna, which flows eastward into Samana Bay, and its principal tributary, Rio Camu. The eastern part of the Cibao Valley includes the fertile "Vega Real" which extends from the swampy lands at the head of Samana Bay nearly to Santiago. The Vega Real is among the most impressively fertile districts in the world. Its nearly level plains yield large crops of cacao, tobacco, and bananas, and its grassy savannas afford excellent pasturage. It is traversed by the Ferrocarril de Santiago y Samana, of interest principally because of the fact that it reaches neither Santiago nor Samana. This is in part due to the sparse Dominican population characteristic even of this most attractive portion of the Republic.

At the time of the discovery the vega (meadow) which extends from the valley of the Yaque del Norte in the north to the valley of

the Yuna River in the east, was the most densely populated section of the island, although, according to the Spanish accounts, the Indians of what is now the Haitian Province of Jeremie were culturally the most advanced. The Ciguayans of the northern mountains spoke a different dialect of Arawak from the Indians of the northern coast of Haiti west of the Yaque Valley. Their speech differed also from that of the Indians of the Vega.

It is significant that the Ciguayans and other Indian groups in eastern Santo Domingo and Porto Rico were in possession of bows and arrows, though lacking in defensive armor. The Arawak of western Haiti and of Cuba and the Bahamas, who had no contact with the warlike Carib, were as yet not acquainted with the bow.

NATIVE TRIBES AND PROVINCES

The Arawak Indians of Santo Domingo were grouped in provinces having more or less well-defined natural boundaries. The political and religious head of each of the principal provinces, of which there were five, was known to the Spanish as a cacique, a term applied by them also to Central American and Mexican Indian chiefs. Caciques were the leaders and advisers of their people and appear to have combined the native offices of chief and medicine man. Their powers were extensive, as they orderd the routine of daily life and work. They assigned to individuals such widely separated duties as communal hunting, fishing, and the tillage of the soil; they also presided at religious ceremonies. Peter Martyr observed that "every king hath his subjects divided to sundry affairs, as some to fishing, other to hunting, and other some to husbandrie." Columbus writes that "I could not clearly understand whether this people possess any private property, for I observe that one man had the charge of distributing various things to the rest, but especially meat, provisions, and the like." No regular tribute was demanded by the caciques from their subjects, but the best of the food and the finest of the agricultural products were reserved for them. According to Oviedo, one species of the smaller rodents of the genus Plagiodontia was reserved for the exclusive use of the cacique and his family. Fewkes says that "as a rule each village seems to have had a chieftain or patriarchal head of the clans composing it, whose house was larger than the other houses and contained the idols belonging to the families. The cacique, his numerous wives and their children, brothers, sisters, and other kindred were a considerable population, often forming a whole village. In addition to the household of the cacique, consisting of his wives and immediate relations, a prehistoric village ordinarily contained also men, women, and children of more distant kinship." The term "cacique" is used in a very loose sense by the early Spanish chroniclers to desig-

nate any leader or headman of aboriginal peoples in America and Malaysia. Caciques were aided by subchiefs or attendants, some of whom governed districts. Under these were the village headmen, of which there were 70 or 80 for each of the five native provinces of the island.

Of the five leading caciques at the time of the discovery only one, Goacanagaric, who ruled over the Province of Marien, on the north coast, remained friendly toward the Spanish. The native Province of Marien extended from Cape Nicolas, on the extreme northwest, to the Rio Yaque del Norte marking the interior boundary of the Province of Marien. This is in the upper Yaque Valley on the southern slope of the northern Cordillera. In Marien, on the north coast, a short distance west of the mouth of the Rio Yaque del Norte, Columbus planted the first Spanish colony in America. This colony was the unfortunate La Navidad, situated near the site of the Haitian town of Cape Haytien. The extermination of this settlement was due not to the ill will of the locally dominant cacique Goacanagaric but to the aggressive hostility of the cacique Caonabo, of the Province of Maguana, and to the dissolute conduct of the members of the colony.

Columbus had suffered the shipwreck of one of his caravels, the *Santa Maria*, near Cape Haytien late in 1492. The large native village of Guarico was located about 2 miles from the scene of the shipwreck. Goacanagaric, the cacique of the northern native Province of Marien, lived there and soon became the friendly adviser of Columbus and of the Spanish.

> The locality of the town of Goacanagari has always been known by the name of Guarico. The French first settled at Petit Anse; subsequently they removed to the opposite side of the bay and founded the town of Cape Francois, now Cape Haytien; but the old Indian name Guarico continues in use among all the Spanish inhabitants of the vicinity.[6]

Maguana, signifying little plain, was ruled at the time of the discovery by the immigrant cacique Caonabo. This cacique, according to some sources, was a Carib, but more likely was a Lucayan, or an Arawak from Porto Rico, which was known to the aborigines of Santo Domingo as the island of Carib. His territory included most of the upper Cibao Valley and adjacent moutains, where the natives mined gold from the streams. At a later period the Cibao Valley developed the richest cacao and coffee lands of the entire island. The Province of Maguana extended to the west coast and included the valley of the Artibonite (Hattibonito) River, forming a portion of the present boundary between the two island Republics of Haiti and Santo Domingo.

---

[6] Irving, Washington, Life and Voyages of Christopher Columbus, vol. 3, p. 227, New York, 1859.

Magua, meaning country of the interior, "inland empire," stretched from sea to sea, from the north to the east coasts south of Samana. It included the central, lower, and best portions of the Cibao Valley, the so-called Vega Real. Guarionex was cacique of the Vega and of the southern slope of the northern Cordillera, while the Ciguayan Indians of Samana Peninsula and of the northern mountains occupied the northern sections of Magua Province under the leadership of the cacique Mayobanex. On the south, the Province of Magua was bounded by the Cordillera Central. The Cibao Valley, especially the Vega Real, was the most densely populated region of aboriginal Haiti. It is still the most prosperous district. The deep, black, loamy soil receives ample rainfall and the valley is still adapted to intensive agriculture now as it was in the time of Guarionex. On the north coast the Province of Magua extended as far west probably as Puerto Plata, while it was broader south of the mountains, where it reached as far westward as the towns of La Vega and Santiago.

Xaragua Province was bordered on the east and rather indefinitely on the north by the Province of Maguana. It formed the southwestern province of the island. It lay for the most part on the inner side of the Gulf of Xaragua, now known as the Gulf of Gonaive, on which Port au Prince is located. Xaragua included the surrounding mountains as well as the dry flat land, where irrigation was developed on an extensive scale. Cotton was produced in comparatively large quantity, considering the relatively unclothed condition of the natives. Xaragua was considered the richest and the best-developed native province of the island. Its cacique at the time of the discovery was Behechio, who, with his sister Anacaona, offered to pay the tribute exacted by the Spanish in produce instead of gold. Anacaona was the widow of the cacique Caonabo, of the Province of Maguana. After the death of Behechio his sister, Anacaona, inherited the right to govern the Province of Xaragua. On one occasion when the Lord Lieutenant (Adelantado) Bartholomew, the brother of Columbus, visited the town of Behechio and Anacaona, these rulers presented Bartholomew with 14 carved wooden seats, 60 earthenware vessels, and 4 rolls of woven cotton. Another name sometimes given to Xaragua is Guaccairima. This term is apparently a broad one and included all of the southwest coast and a large portion of the southern coast as well. Gonave Island, situated a few miles from the west coast, was noted for the excellence of its native wood carving, and the islanders carried on a trade with villages of the mainland near by.

The fifth great native province, that of Higuey, offers difficulty in the defining of its boundaries. It probably included all of south-

eastern Haiti south of the Cordillera Central and east of Samana Bay.

Las Casas speaks of Cotabanama as the cacique of Higuey "Province," while other writers refer to the cacique Cayacoa as ruling the eastern portion of the island. Still other writers mention the name of the "queen" Higuanama as a ruler of the eastern Province of Higuey. The several writers are, of course, referring to various periods of time, as the Spanish ultimately succeeded in destroying all native rule and in wrecking the lives of the native caciques.

In the De Orbe Novo of Peter Martyr an entirely different classification of native provinces is given from that of other Spanish chroniclers. Martyr names the eastern Province of Higuey with the term "Caizimu," which, according to his description, extends from Cape Eugano as far westward as the river Hozama (Ozama), on which is located the capital city, Santo Domingo. The northern border of this province of Martyr's was marked by precipitous mountains (Cordillera Central), which, on account of their steepness especially, bore the name "Haiti." The Province of Huhabo (Magua?), according to Martyr, lay between the mountains of Haiti and the Iacaga (Yaque) River. The third province from the east was supposed to extend as far west as the mouth of the Iacca (Yaque) River, one of the rivers "dividing the island into four equal parts." The province was supposed by Martyr to extend as far as the island of Cahini (?), almost touching the north coast of Hispaniola (spelling is Martyr's) at the place where the colony was once founded (La Navidad). Martyr's Province Bainoa may either be Marien or Maguana. The remainder of the island along the west coast formed the Province of Guaccairima (Xaragua), thus called "because it is the extremity of the island." [7]

The statement made by the Spanish friar Ramon Pane confirms the notion that the language of the Ciguayans of Samana differed from that prevailing elsewhere on the island. Pane was ordered by Columbus to live among the natives and to record what he might observe concerning their religious beliefs and practices. Pane's notes are brief but invaluable. The manuscript is incorporated in Churchill's Voyages with Ferdinand Columbus's narrative of "the history of the life and actions of adm. Christopher Columbus, and of his discovery of the West Indies, called the New World, now in possession of His Catholick Majesty."

The following passage from the manuscript is of interest in this connection:

> The admiral told me that the language of the Province Madalena Maroris was different from the rest, and was not understood in all parts of the coun-

[7] De Orbe Novo, vol. 2, pp. 366, 367.

try; and therefore bid me go and reside with another principal cacique, called Guarionex, lord of many subjects, whose language was understood all over the island. I went to reside with the said Guarionex. I said to D. Christopher Columbus: My lord, why will you have me go and live with Guarionex when I know no language but that of Maroris? (Macoris—of the long-haired Ciguayans of Samana and the northeast coast.) Be pleased to give leave that one of these Nohuircis (?) who know both languages go with me.

Differences in speech between the Macorises (Ciguayans) and the subjects of Guarionex of the Cibao Valley were in all probability not far-reaching. The Ciguayans were a mountain folk and spoke an Arawak dialect. They were not Caribs, a fact brought out by their traditional friendship for the Indians of the Cibao Valley and their alliance with them in war.

NONAGRICULTURAL CAVE DWELLERS

That the Taino (Arawak) of Cuba were preceded by an earlier aboriginal population has been reported by Fewkes, Harrington,[8] and others, based on evidence of an archeological nature from caves in Cuba but anticipated in vague reports by Oviedo and others as also present in southwestern Haiti. Morales wrote that in the mountains of western Haiti there existed wild men without fixed abode, without a language (obviously not understood by the Arawaks), and not given to the practice of agriculture. Oviedo wrote that a cave population in western Haiti was not subdued until 1504. The National Museum expedition of 1928 found extensive cultural remains of a pre-Arawak population in the caves of Samana in northeastern Santo Domingo, in the territory later occupied by the Ciguayan Indians.

Martyr[9] wrote in his De Orbe Novo that a cave population similar to the Guanahatabeyes "Ciboneys," also mentioned by Las Casas and Velasquez, had lived on the southwestern peninsula of Haiti. Martyr relates that "it is said there is a savanna district in the most westerly Province of Guaccairima (Xaragua) inhabited by people who only live in caverns and eat nothing but the products of the forest. They have never been civilized nor had any intercourse with any other races of men. They live, so it is said, as people in the golden age, without fixed homes, or crops or culture; neither do they have a definite language (apparently not understood by the Arawaks). They are seen from time to time, but it has never been possible to capture one, for if, whenever they come, they see anybody other than natives approaching them, they escape with the celerity of a deer." Oviedo also mentions the cave folk of the Province of Guaccairima

[8] Harrington, M. R., Cuba before Columbus, Indian notes and monographs. Mus. Amer. Indian, Heye Foundation, vols. 1 and 2, 1921.

[9] De Orbe Novo, the Eight Decades of Peter Martyr d'Anghera, p. 380. New York and London, 1912.

(Xaragua). Las Casas lived in the villages of the extreme southwestern portion of the island in Xaragua. He did not see the cave dwellers reported by other chroniclers, but reported the population of Xaragua (Guaccairima, the present Haitian Province of Jeremie) as resembling in their culture the Higuey Indians of Santo Domingo. He mentions the "Ciboneys" as being a primitive group living in the mountains of the interior and as not given to the practice of agriculture as were the natives of the central valleys and coastal plains.

Aside from the casual and in part untrustworthy references to the primitive cave-dwelling population of Haiti to be found in early Spanish narratives, there exists no reference in the early literature of the West Indies hinting at the existence of a pre-Arawak race of Indians.

It remained for archeological investigations to substantiate, at least in part, the references contained in the literature cited. Harrington's discoveries in Pinar del Rio Province in western Cuba, also in other sections of the island of Cuba, are well known. The recent discovery of a somewhat similar culture from cave deposits in eastern Santo Domingo by the United States National Museum expedition is significant. It is possible that Arawak immigrants to the islands of the Greater Antilles had subjugated these earlier people in much the same manner as they themselves were supposedly replaced by the Carib in the Lesser Antilles. Las Casas believed this to be the case when he wrote, referring to the natives of Cuba, that the "servants subjugated by the invaders from Haiti were known as 'Ciboneyes.'" These aborigines of western Cuba spoke a language that Columbus's Taino interpreters from the Lucayan (Bahama) Islands could not understand. Harrington is authority for the statement that "Ciboney" culture can be traced from one end of the island of Cuba to the other.

Caves were used by the island Arawak of Haiti, Cuba, and Porto Rico for various purposes. Evidence collected by the United States National Museum expedition points to their use of the caves of Samana as temporary dwelling places at a time when the earlier pre-Arawak cave-dwelling population had already been superseded. From the literature we gather that they also employed the caves as ceremonial chambers. The large "pillar rock" carvings, in which stalagmites located near the cave entrances are so shaped as to resemble anthropomorphic zemis or sacred images, point to the use of the Samana caves as Arawak places of worship. An observation made by Spanish writers is that fishermen occupying the small islands off the coast of Cuba and Haiti were subjects of the superior Taino (Arawak), but that they did not live in caves. Neither do we find

any authentic reference in the literature on the tropical South American tribes relative to their use of caves for other purposes than as burial chambers or for spirit worship. In South America some caves yield no skeletal material, while others in the Orinoco Valley contain pottery urn burials. In eastern Brazil occur caves that were formerly used as shelters by groups of hunters. Caves on the island of Trinidad yielded no skeletal remains, although caves on the island of Jamaica contained burials. No burials were found in the caves of Samana, although rock-cleft burials on near-by islands were uncovered by the Museum expedition.

HISTORICAL NARRATIVES AND ARCHEOLOGICAL FIELD WORK

Source material to the ethnology of Santo Domingo.—One naturally turns to the records left by Columbus and other Spanish explorers for the first account of aboriginal life and customs in Santo Domingo. There is, however, scant mention there of aboriginal earthenware beyond the bare statement that two kinds of vessels, drinking goblets and food dishes, were seen. Herrera later writes that the water containers were handsomely painted. The Hakluyt Society of London has done excellent work in publishing in English, first, the Select Letters of C. Columbus, in 1847, and, later, in 1893, the Journal of the First Voyage of Christopher Columbus. This journal is a complete account of his contacts with the natives of the island and has been used by such historians as Las Casas, who had access to the original manuscript of Columbus.

The two great works of Las Casas are the Historia General and the Historia Apologetica de las Indias. Las Casas mentions the fact that he began this latter work in 1527 while living in the Dominican monastery near Puerto Plata. In 1875 there appeared a complete edition of Las Casas's works in Spanish. This great Spanish historian is the principal accuser of Spanish misrule and chief defendant of the aboriginal population.

In the second volume of Churchill's Collections of Voyages and Travels there is embodied the narrative of Ferdinand Columbus written in the form of a biography of his father, Christopher Columbus. During the interval of his second voyage, Columbus detailed a Franciscan monk, Friar Ramon Pane, to study native religious practices and ceremonials. His observations regarding mythology and objects used in religious art give a first-hand interpretation of the clay figurines and stone and wood carvings of life forms. He narrates that " in the island of Ganabara (Gonave in the Gulf of Port au Prince) which lies at the western extremity of Hispaniola, it is the women who are thus employed; the various pieces are decorated with representations of phantoms which they

pretend to see in the nighttime, and serpents and men and everything that they see about them."

In point of time, the next historical narrative to appear was the First of Peter Martyr's Eight Decades, also known as the De Orbe Novo. The first Decade was published in 1511 and is drawn from the accounts of Andreas Morales, who was sent by Governor Ovando, the successor of Christopher Columbus as governor of Santo Domingo, to explore the interior of the island.

Fernandez de Oviedo published his Natural History of the Indies in 1526. Oviedo lived in Santo Domingo shortly after Morales explored the interior of the island. Another interesting and valuable record is that of Girolamo Benzoni, who visited Santo Domingo in 1541 and remained there for 14 years. His History of the New World was published in English by the Hakluyt Society in 1857. Benzoni's observations regarding native life are first hand, as he lived among them almost as a mendicant.

Several of the later publications are for the most part extracted from these early writings. Worthy of mention are such books as Jeffery's Natural and Civil History, published in London in 1760; Charlevoix's Historia de l'Isle Espagnole, which appeared in 1730; Herrera's book, in which mention is made of painted aboriginal pottery, also borrowed from the accounts of Las Casas, was published in 1601. Washington Irving's Life of Columbus, first published in 1827, was inspired by the publication of the Navarette documents pertaining to the life of Columbus. Irving's treatment of Spanish contacts with native life during the days of Columbus is exhaustive.

A somewhat different approach is that of J. Walter Fewkes, whose study and compilation of the literature pertaining to the life of the natives of Porto Rico and of Santo Domingo, while exhaustive in itself, is supplemented with archeological data. The "magnum opus" of Fewkes's The Aborigines of Porto Rico and Neighboring Islands, appeared in 1907 in the Twenty-fifth Annual Report of the Bureau of American Ethnology. This work embodies the results of studies begun in Porto Rico in 1902. Fewkes visited Santo Domingo in 1903. A publication, Preliminary Report on an Archeological Trip to the West Indies, describing these early studies, appeared as a Smithsonian Miscellaneous Collection number in 1904. In this early report were described earthenware vessels from the Archbishop Meriño Santo Domingan collection. Fewkes also studied the Imbert collection at Puerto Plata and other pottery collections in Santo Domingo. Among the several publications of Fewkes pertaining to the archeology of the island of Santo Domingo is his monographic treatment of the Indian Collection from the Greater and Lesser Antilles in the Museum of the American In-

dian, Heye Foundation, which appeared in the Thirty-fourth Annual Report of the Bureau of American Ethnology in 1922 under the title "A Prehistoric Island Culture Area of America." This work is particularly useful in the comparative study of earthenware from the several islands of the West Indian Archipelago. In the preparation of this report Doctor Fewkes visited museums in America and Europe and engaged in field work in several of the West Indies, notably Trinidad. Doctor Fewkes discovered what has also been a stumbling block in later archeological studies, namely, that West Indian archeological stations and shell midden deposits are of a nature to preclude successful stratigraphic studies.

> Excavations in this cave [3 miles north of Manati, called Cueva de las Golondrinas, "Cave of the Swallows"] showed that it was once frequented by the aborigines, while pictographs on the walls gave other evidence of their former presence. There were found among the débris, on the floor, many fragments of the pottery peculiar to the islanders, and other evidences of primitive life, among which were broken celts, bones of animals which had served for food, and also ashes and charcoal. All of the implements and utensils were of ancient manufacture and so numerous that many people must have frequented this coast region and used this cave as their camping place. A few broken human bones were also uncovered, but whether they indicated former anthropophagous feasts or hurried interments could not be determined. The trenches dug in the cave floor through 10 feet of débris showed, at all levels, art objects similar to those occurring on the surface, indicating no change in culture. There was no evidence of any great modification between the life of the earlier and later occupants, and no satisfactory proof that the occupancy of the cave was of very great antiquity.[10]

Archeological explorations prior to 1928.—In his classifications of archeological culture areas, W. H. Holmes mentions as representative explorers of West Indian sites such names as Ober, Branch, ten Kate, Montane, Im Thurn, Duerden, Fewkes, De Booy, Huckerby, Latimer, and others. This list might be extended, although the number of explorers who have contributed to our knowledge of the earthenware forms and designs from the several islands are few.

Sir Robert Schomburgk was the first student to describe archeological objects from kitchen middens in Santo Domingo. Schomburgk explored the Central Cordillera, locating what he mistakenly supposed was an Indian cemetery at Constanza, in the Province of La Vega. He also was the first to describe the well-known Indian stone inclosure at San Juan de Maguana in the Province of Azua, known as the Corral de Los Indios.

> The circle consists mostly of granite rocks, which prove by their smoothness that they have been collected on the banks of a river, probably at the Maguana, although its distance is considerable. The rocks are mostly each from 30 to 50 pounds in weight, and have been placed closely together, giving the ring

[10] Fewkes, J. Walter, Preliminary Report of an Archæological Trip to the West Indies. Smithsonian Misc. Coll., vol. 45, p. 114, Dec. 9, 1903.

the appearance of a paved road 21 feet in breadth, and as far as the trees and bushes, which had grown from between the rocks, permitted me to ascertain 2,270 feet in circumference. A large granite rock 5 feet 7 inches in length, ending in obtuse points, lies nearly in the middle of the circle, partly imebdded in the ground. * * * It has been smoothed and fashioned by human hands * * * the cavities of the eyes and mouth are still visible. A pathway of the same width as the ring extends from it firstly due west and turns afterwards at a right angle to the north, ending at a small brook.[11]

The researches of William M. Gabb, 1869–1871, are of particular interest in the stratigraphical study of cave deposits of the Santo Domingan littoral in the vicinity of Samana Bay.

During the years 1869–1871 William M. Gabb conducted explorations in Samana Province, describing, among other archeological sites, certain caves which he explored in the vicinity of San Lorenzo Bay. These caves were also investigated by the writer in 1928. Several of them answer the general description of the cave explored by him. It is possible, in the time intervening since the San Lorenzo caves were explored by Gabb, that a general uplift of the cave floors has taken place, thus making impossible the identification of a cave "with floor flush with the level of the tide" as he describes it, when, as at the present time, each of the caves in the vicinity of San Lorenzo Bay has floors raised 10 feet or more above the tide level. Gabb makes the following summary regarding his investigations of the midden desposits in the cave.

In the cave where I slept there is an extensive and interesting midden divisible into two eras; the older marked only by shells and a few turtle and fish bones, resting on the rocky floor and through which I excavated to a depth of 9 feet. Over this is a thinner layer of ashes with bones of birds, agouti, fish, and turtles, and an abundance of pottery evidently of the immediately pre-Columbian era. Over this, liberally intermixed with bat guano, is a modern deposit of broken earthen and iron kettles and beef and pig bones, indicative of a higher, or at least, more modern civilization, though justice requires us to admit that the pottery is inferior in workmanship, in elaborateness, and in beauty of design to the preceding era. It is a remarkable circumstance that, although the Indians of the pottery period manufactured polished stone hatchets and other implements equal in degree of finish to the finest ever discovered, not a stone instrument was discovered in the cave, unless we except some rough rounded pebbles found among the shells.[12]

The first intensive archeological investigations to be conducted in Santo Domingo were undertaken by Theodoor de Booy in 1913 for the Museum of the American Indian, Heye Foundation. De Booy's explorations extended southward from Cape Macao. Explorations were also carried on in the caves of the island of Saona, which con-

[11] Schomburgk, Sir Robert, Ethnological Researches in Santo Domingo, Journ. Ethnol. Soc., vol. 3, p. 121, 1854.

[12] Gabb, William M., On the Topography and Geology of Santo Domingo, Mem. Amer. Philos. Soc., vol. 15, pp. 146, 147, 1872.

stitutes the extreme southeastern projection of the island. In 1916 a large shell heap on the Cristobal Colon sugar estate on the Higuamo River near the town of San Pedro de Macoris, on the southern coast east of Santo Domingo City, was excavated. Pottery types discovered by De Booy in eastern Santo Domingo are practically identical with earthenware forms recovered by the writer at San Juan on the peninsula of Samana.

The work of Narciso Alberti, of the Dominican National Museum, is little known to the American student but deserves consideration because of its peculiar viewpoint. Alberti sees Carib influence in the Samana cave deposits, but looks to Phoenician immigrants as having produced geometric inscriptions in the cave near Cotui, known as La Guacara del Comedero. He regards these Tainan rock inscriptions or petroglyphs as letters of the alphabet inscribed by pre-Columbian Phoenician colonists.

Archeological exploration, stimulated in Porto Rico by the excellent monographic treatment of the subject by Fewkes in the Twenty-fifth Annual Report of the Bureau of American Ethnology, continued to be neglected in the neighboring island of Santo Domingo. Fewkes writes that in his pioneer reconnaissance of Porto Rico in 1902–1904 he "had not the time or means to engage in prolonged intensive work of excavation of caves, shell heaps, and ball courts," called "batey" by Oviedo but "juegos de bola" colloquially. Fewkes continues:

> There is much work to be done in this direction and a fair beginning has already been made. The opportunities are very great. Sites of prehistoric settlements are many, and those of historic character can easily be identified. As in all the West Indies, the archeologist has barely begun his work, and much remains to be done before the story of the culture of the Tainan race can be adequately made out. One of the most promising islands awaiting the spade of the archeologist is Haiti, and it is to be hoped that ere many years the antiquities of this island may be explored.[13]

The work of Mr. and Mrs. Lathrop in excavating shell heaps in Porto Rico; the excavations of Porto Rican ball courts conducted by J. A. Mason and by Haeberlin, have been supplemented by the investigations of caves and shell middens by Aitken,[14] Mason,[15] Haeberlin,[16] and others.

In his book Jefferys, writing during the middle of the eighteenth century, makes this observation regarding the beginning of archeology in Santo Domingo:

---

[13] Fewkes, J. Walter, A Prehistoric Island Culture Area of America. Thirty-fourth Ann. Rept. Bur. Amer. Ethn. (1912–13), pp. 49–271, 1922.

[14] Aitken, Robert T., Porto Rican Burial Caves. Proc. Nineteenth Int. Congr. Americanists, pp. 224–228, Washington, 1917.

[15] Mason, J. Alden, Excavation of a new Archeological Site in Porto Rico. Proc. Nineteenth Int. Congr. Americanists, pp. 220–223, Washington, 1917.

[16] Haeberlin, Herman K., Some archeological work in Porto Rico. Amer. Anthrop., n. s., vol. 19, pp. 214–238, 1917.

The present inhabitants of Hispaniola still find the figures of Zemes in several parts of the island, and it is by this sign that they know where Indian towns formerly stood, as well as by certain heaps of shells found underground; the Indians having been very fond of shellfish; and as often as this happens, very curious discoveries are to be made, by continuing to dig a little, in the neighborhood of such heaps; for here are generally to be found everything the people used; such as earthen vessels, flat earthen plates for baking cassava bread, hatchets, and those little plates of gold they used to hang to their nostrils, and sometimes to their ears; but above all, a considerable quantity of Zemes of every form.[17]

Field work in Samana Province, 1928.—Early in 1916 Dr. William L. Abbott, whose studies in the natural history of the Dominican Republic began as early as 1883, visited the Samana caves and obtained material of great interest to the archeologist and biologist. Doctor Abbott later paid repeated visits to the eastern coastal region, notably the peninsula of Samana and the northern Dominican coast as far west as the Province of Monte Cristi adjoining the Republic of Haiti. Trips to several localities in the highlands of the interior, in the Provinces of La Vega and Azua, were also made. On these expeditions he made valuable collections of mammals, birds, reptiles, mollusks, insects, and Indian artifacts.

In Samana, Doctor Abbott succeeded in obtaining living jutias (*Plagiodontia hylaeum*), supposed to have become extinct shortly after the early decades of the Spanish conquest. In the upland mountain valley of Constanza he discovered a form of crossbill (*Loxia megaplaga*) related to the white-winged crossbill, a species restricted in the breeding season to the Boreal zone of North America.

Through the generosity of Doctor Abbott a project was initiated in 1928 to correlate biological investigations in the Dominican Republic with historical accounts regarding the aborigines and archeological excavations of open village sites, kitchen middens, and of midden deposits in the Samana caves. Dr. Gerrit S. Miller, jr., of the National Museum, and the writer spent a part of the winter and spring of 1928 in exploration of caves on the south shore of Samana Bay and of aboriginal village sites on Samana Peninsula. The combined objectives of the expedition were to recover skeletal and cultural remains from shell heaps, kitchen middens, and aboriginal habitation sites, as well as to make general collections of the plants and vertebrates of the region.

Working from the town of Santa Barbara de Samana as a base, the expedition crossed to the caves on the south shore of Samana Bay, where a month was spent in the caves of the Playa Honda coast. Living quarters were established in the cave known as "Boca del Infierno." This cave has three main openings, two of which

[17] Natural and Civil History of the French Dominions in North and South America. London, 1760.

face the sea, and several large openings in the roof caused by the fall of rock masses loosened by water seepage.

No fresh water was found in any of the caves explored, although a small quantity of water saturated with calcium carbonate dripped from the cave ceiling and readily formed stalactites and stalagmites. Shards of aboriginal pottery coated with calcium carbonate lay in small heaps near the stalactites. A few unbroken bowls were recovered from under rock masses but the midden deposits generally contained no pottery refuse such as was to be seen in the kitchen middens surrounding habitation sites on Samana Peninsula.

According to historical accounts, fish nets of cotton cord were woven by the pre-Columbian Indians of Samana, but the sole reminder of this aboriginal fishing practice was the recovery of several net weights of notched stone from the middens near the cave entrances. During a subsequent visit to the Samana caves in 1929 the writer succeeded in recovering two fishhooks of shell from the midden débris on the cave floor in the Boca del Infierno.

The prehistoric cave dwellers of Samana subsisted principally on the meat of the conch and of other shellfish. A careful search by Doctor Miller and the writer failed to reveal a bed of live conchs anywhere near the caves of the Playa Honda coast. The absence of beds of live conchs is remarkable, as the bulk of the midden material covering the cave floors is made of these shells. Natives professing to know of conch beds never were able to locate one, although a small number of recently dead conch shells of the same species (*Strombus pugilis* L.) as those of the cave deposits were found in one of the shallow coves near the keys. The much larger *Strombus gigas* appeared in smaller quantities in the cave middens, but was fairly plentiful in the kitchen middens of the open village sites on the peninsula.

Deposition of shells in the kitchen middens of the caves had produced heaps of varying thickness; but in those portions of the caves, usually near the entrances, which were obviously devoted to culinary purposes, the refuse heaps reached a thickness of 9 feet or more. Where the deposits had not been disturbed, excavation was undertaken. The floor of the cave is covered with a thick layer of reddish-yellow soil, not at all sandy. The layer is of irregular depth, greatest near the cave entrance, but sloping down to isolated heaps at a considerable distance away.

Cave middens contain conch, clam, and other species of shell, crab, claws, mammal, fish, turtle, and bird bones cast there by the pre-Columbian Indian cave dwellers. The bottom of the deposits of shell is embedded in the yellowish soil, while the upper sections are interspersed with deposits of ash, charcoal, and a small quantity

of artifacts, such as shell utensils, shards of broken pottery, and implements of flaked stone.

Above this layer is a deposit varying from a few inches to 2 feet in thickness belonging to historic times. This upper culture layer is nondescript in the extreme and includes fragments of pig, cow, and other animal bones, also coconut and calabash shells. Tools of iron, including a Spanish ax, were recovered from the vicinity of improvised fireplaces. Some of the more habitable caves occasionally are still occupied by Dominican fishermen and farmers who come to the south shore of Samana Bay to tend their fish pots and to work in their small potato, coconut, and banana plantations. One large cave at the head or western end of the bay near the mouth of the Barracote River is occupied in season by a number of colorado wood (*Rhizophora mangle*) " mangle rojo " or tan-bark peelers, who work in the swamps during the day but find the cave shelter a satisfactory temporary domicile.

Covering much of the interior floor of the caves are large deposits of bat guano, which have been extensively exploited for use as a fertilizer, and small deposits of pellets from an extinct species of giant owl. The removal of guano disturbed some of the culture deposits and thus hampered scientific investigations. Archeological investigations in caves in Cuba and Porto Rico have revealed human burials underneath the midden deposits. These burials have been ascribed to pre-Arawak aborigines. Their undeformed crania differ from those of the Arawak whose skulls are uniformly artificially deformed. No skulls were recovered from underneath the Samana cave middens by excavating, although a few human bones and teeth were exhumed from low levels. Cuban finds were not duplicated in the Samana caves where careful search failed to reveal burials of any description. Cave burials have been discovered in the mountainous interior of the Province of La Vega, principally in a cave near Manabao. Numerous rock ledge burials with deformed and undeformed crania were discovered by the writer in Samana and La Vega Provinces. It is not known whether the skeletal material extracted by native Dominican investigators from Manabao belonged to the Ciboney or to the Arawak, that is, whether the crania showed anterior flattening or not.

In Samana, as in the caves from other provinces, surface finds were distinctly post-Columbian, while the extensive middens of aboriginal origin contained rude artifacts of shell and bone and of flaked stone; however, but little of those artifacts that have come to stand as sponsors for pre-Columbian Arawak culture, namely, polished stone implements and unpainted earthenware with incised or otherwise applied conventional decorative designs.

No stratification showing definitely marked differences in the culture remains was noted, except in one instance. The cave named "Cueva del Templo," where a clearly marked break in the cave deposits was observed, lies about two-thirds of a kilometer inland from the shore of San Lorenzo Bay, an arm of Samana Bay. The cave opens on the side of a cliff just east of the abandoned railroad track that formerly supplied the American Banana Co.'s plantation. In this cave was found a layer of clam and oyster shells thickly interspersed with animal, bird, and fish bones and with crab claws, forming a deposit varying from 3 to 5 feet in thickness. As excavation continued, there was found underneath this layer a stratum of black loamy soil of approximately 8 inches thickness. Underneath this deposit of soil was another culture deposit varying in depth from 4 to 6 feet. This included mostly conch shells and practically no animal bones. Crude implements of shell, bone, and flaked stone were recovered from this lower culture deposit, while pottery shards, some of which are decorated, and food bowls of pottery were excavated from the upper culture stratum.

Another cave containing culture deposits is on a small island key near the abandoned wharf. It faces the open waters of San Lorenzo Bay and has extensive culture deposits. As the cave was occupied, only sporadic excavation could be attempted. Shards of decorated and undecorated pottery accompanied the usual artifact finds. It would appear from this that Arawak groups had at one time occupied the cave and, perhaps, were responsible for the entire culture deposit of this particular cave.

The floor of the cave known as San Gabriel lies from 10 to 20 feet above sea level. San Gabriel is a small islet just off the south shore of Samana Bay a few kilometers west of the San Lorenzo arm. The cave occupies practically the entire interior of a limestone island key and is one of the most habitable caves of the Playa Hondo coast. The floor of the cave has been raised by the deposition of fallen rock masses which later disintegrated. Then, too, the gradual uplift of the land surface noticeable throughout the entire Samana Bay area has brought the floor to a level high above the tide. The middens within the cave were therefore entirely dry. Deposits of conch, clam, and other shells are approximately 8 feet deep on the cave floor in the proximity of the only available cave entrance. This section of the cave floor is roughly 20 feet wide and 50 feet long. The aboriginal hearth fire was maintained here underneath an overhanging ledge of rock and the kitchen débris making up the deposits in this area were sheltered from rain and storm. Hearth fires had been built up on successive layers of ashes and charcoal to a height of several feet, so that a sharp slope away from the fireplace toward the water's edge characterized the midden at this point.

A trench was dug from the outer edge of the midden nearest the water's edge, toward the center of the deposit. This trench was 4 feet wide and was carried down to the bottom of the midden. Scattered through the midden were fragments of shells, principally conch and clam; fragmentary shards of undecorated pottery; flaked and slightly chipped stone implements; caches of spherical pebbles and of coral; polishing stones and stones obviously used as hammers. An unusually large amount of partially burned or roasted turtle carapaces and leg bones was included in the kitchen middens of San Gabriel cave, although here as in other cave middens mollusk shells far outnumbered mammal and bird bones.

From the Samana caves were obtained three distinct types of pottery—a thin brown ware, well fired but undecorated; a coarser, poorly fired, but decorated terra-cotta ware; and a third type consisting of fragments of crude, brick-red pottery, similar to the thick-walled globose bowl shapes of Samana Peninsula, but also fragments of the typical earthenware cassava griddles are of frequent occurrence. The poorly fired, decorated terra-cotta ware consisted of fragments of large shallow bowls with zoomorphic figurine handles. Shards of decorated pottery covered with rectilinear incised lines were outnumbered by innumerable fragments of shallow bowls and of potsherds, plain for the most part, but belonging to a thin-walled, well-fired type of brown ware.

An interesting discovery was that of a many faceted tool of sandstone with each dimensional diameter approximately 2 inches. This object was dug up from the bottom of the midden at the Cueva del Templo. A similar faceted stone object has been designated as a celt polisher by M. R. Harrington,[18] supposedly characteristic of Tainan stone culture in Cuba and elsewhere in the Greater Antilles. The implement is undoubtedly a polishing implement, but its presence at the bottom of a midden where other characteristic Arawakan objects are lacking is anomalous. A similar multiple-faceted stone was recently excavated by G. A. Duncan in Haiti from a shell midden on the large sisal plantation near Fort Liberte on the north coast. It is more than likely that this and other faceted polishing implements of stone were also of use to the primitive Arawak potter. Improvised implements of shell or stone were found in the middens of each of the caves visited. Hammerstones, abrading tools, and flaked stone implements were, however, markedly similar and uniform in type. Stone knives, scrapers, picks, and hammerstones were of the same type as those recovered later from open village and habitation sites on the north coast of Samana Peninsula and in the Province of Monte Cristi.

[18] Cuba before Columbus, Indian notes and monographs, Mus. Amer. Indian, Heye Found., vol. 2, pl. 108, 1921.

But little human skeletal material was obtained from the cultural deposits of the Samana caves, although the rock-cleft burials of Lower Orange Key near the head of Samana Bay yielded undeformed skulls and skeletons in a fair state of preservation. With these undeformed skulls were exhumed tubular stone beads, of a greenstone resembling jadeite, and small zemis and pendants of shell of the same type as shell zemis recovered in 1930 from a midden near the Dominican village of Andres on the Caribbean coast about 25 kilometers east of the capital city of Santo Domingo.

It might be stated here that several forms of aboriginal burial prevailed throughout the several native provinces of Santo Domingo. In general, urn burial combined with a specialized form of secondary inhumation prevailed in Samana, although burial caves have been discovered elsewhere in Santo Domingo, also in Cuba and in Jamaica. At Anadel, in a midden 2 kilometers east of the Dominican village of Santa Barbara de Samana, several large overturned terra-cotta funerary vases containing the skull and long bones of individuals were found at a depth of 3 feet. A similar practice was observed in burials at San Juan, an aboriginal village site on the north coast of Samana Peninsula due north about 10 kilometers distant from Santa Barbara de Samana. Urn burials have been found in St. Vincent, in the Lesser Antilles. Columbus thought he observed the aborigines of Paria, on the Venezuelan coast, drying bodies of their caciques on a frame over a fire. Ferdinand Columbus[19] describes an aboriginal Haitian practice where "they open the cacique and dry him by the fire in order that he may be preserved whole. Of others they take only the head."

After completing archeological investigations of the cave deposits, work was begun at two Ciguayan village sites on the north shore of Samana Bay, on the mainland of Samana Peninsula. These former aboriginal village sites were systematically excavated in part—one at Anadel, a point 2 kilometers east from the Dominican town of Santa Barbara de Samana, facing the north shore of the bay; the other at the mouth of the San Juan River on the north coast of Samana Peninsula. The Ciguayan site at Anadel was worked first. This former village occupies a tract of about 5 acres. Only a small portion of the site was found suitable for working. Much of the accumulated pottery, kitchen refuse, and mammal and bird bones were found to be near the north side of the site facing a small stream which flows into the bay a short distance away.

A large quantity of cultural remains, consisting of decorated and undecorated pottery, implements of shell, bone, and of stone, to-

[19] Bourne, E. G., Columbus, Ramon Pane and the Beginnings of American Anthropology. Amer. Antiq. Soc., 1906.

gether with ceremonial objects, principally amuletic and zemi forms, were excavated from the midden deposits. Bones of small mammals, turtles, birds, and fish, and mollusk shells of different species embedded in the midden were collected as examples of aboriginal food practices. Work was continued at Anadel for a period of three weeks. Altogether a greater variety of artifacts was secured from the Anadel site than from the cave middens of the south shore. Artifacts from Anadel on the north shore of Samana Bay and from the cave middens are sufficiently similar to justify a belief in a certain degree of tribal identity for the two regions. The lower stratum of cave deposits belongs perhaps to a pre-Ciguayan troglodytic population, but the artifacts there found were so few that any conclusion formed on the strength of negative evidence alone is of the nature of an assumption.

The most extensive site explored by the expedition in 1928, and the last of the season's projects to be undertaken, was the Ciguayan village site at the mouth of the San Juan River, on the north coast of Samana Peninsula. This village site is presumably the former principal town of the Ciguayan Cacique Mayobanex. A little bay known as Puerto Escondido indents the abrupt coast line and is fully exposed to the Atlantic Ocean and the incoming tide and breakers. Primitive travel in native dugout boats must have been difficult in the extreme, but fishing for manatee was nevertheless successful, as vouched for by the numbers of hafted picks shaped from the ribs of the manatee found interspersed throughout the midden at the San Juan site.

The valley of the San Juan River is accessible by horse and bullock transportation only, as there are no roads suited to wheel traffic. The soil is rich and deep, and clumps of bamboo and numerous tiny banana and plantain gardens become more numerous as the valley broadens out near the mouth of the stream and the north shore of the peninsula. The hills here become rougher and more picturesque. Gabb, who was at the site of the San Juan village in 1869, speaks of the lower valley as being "as wild a spot as can well be imagined, a long sand beach, ending abruptly against a high bluff of black rocks, with the broad Atlantic thundering against it with a ceaseless roar." When Gabb visited the valley a small settlement of two huts was near the mouth of the river. The United States National Museum expedition found in 1928 several huts of squatters and tenants scattered about the area, but no systematic attempt at settlement and agriculture anywhere in the valley. The peninsula as a whole is undeveloped and is almost entirely covered with nondeciduous forests. Judging from the size of the midden at San Juan and from the large quantity of pottery fragments scattered about or embedded in the midden, the aboriginal population

of the peninsula in pre-Columbian times must have been greater than is the Dominican population at the present time.

While working at San Juan living quarters were established at the Finca de la Esperanza, an abandoned cacao plantation picturesquely situated among the mountain ridges which traverse the entire length of the peninsula. The finca was well adapted to our purposes, being healthfully located in a region high above the mosquito and fly infested coast. Each morning the long journey down the mountain trail to the coast was made on the backs of rather ill-tempered diminutive stallions. The more powerful but no less sure-footed bulls carried back up the mountain trail our newly acquired specimens of natural history, pottery, and other cultural objects.

Large quantities of leg bones of pigeons were obtained at the San Juan site. Neither pigeon bones nor manatee ribs were found in the Anadel midden, which otherwise was much like that of San Juan. Cave middens of the south shore of Samana Bay generally lacked large quantities of pottery fragments; some of the cave deposits yielding no pottery at all. It is noteworthy that of the comparatively small amount of decorated pottery obtained from the cave middens, only incised decorative designs predominated. Anthropomorphic or zoomorphic molded figurine heads, so common to Arawak sites, were almost entirely lacking in the cave middens.

A noteworthy exception to the statement just made is the large globular bowl, U.S.N.M. No. 341055, which has characteristic Arawak (Tainan) decorative designs, including both incised and applied zoomorphic figurine heads. This vessel was recovered from under a mass of fallen rock on a ledge in the Cueva del Templo, inland from San Lorenzo Bay. It is probable that the find represents later Arawak occupants than those who are responsible for the large shell middens which are entirely free from pottery fragments.

The environs of Samana Peninsula and Bay are of especial interest to students of West Indian archeology because of the presence there of many heretofore unexplored village sites of the somewhat anomalous Ciguayan Indians. Columbus thought these Indians of Samana to be cannibals and Caribs, as they were agressively hostile and met the landing crew from the longboat of Columbus's flagship, the *Nina*, equipped with bows and arrows, sword clubs, lances, and ropes with which to tie up the Spanish they intended to make prisoners. In his assumption that these Indians were Caribs of cannibalistic tendencies Columbus was in error, as the Ciguayans were later found to speak an Arawak dialect, somewhat different from that spoken elsewhere on the island, but certainly not Carib. A striking difference in their culture trait complex lay in their hairdress, as other Arawak tribes throughout the island did not permit their hair to grow long. Samana is the native Arawak term for the territory

roughly corresponding to the present boundaries of the Dominican Province of Samana. It was formerly also written Xamana.

Work on the Samana Peninsula sites concluded the 1928 season for the United States National Museum expedition, due to the approach of hot weather in May. Rainfall is very heavy in Samana, but the expedition was remarkably fortunate in that the rainfall during the early months of 1928 was much below normal. Doctor Abbott observed that normally it is raining at some point in Samana Bay or the surrounding shore practically all the time. Rainfall is more abundant at Sanchez, at the head of the bay, than at Samana, farther to the east. Precipitation records at Sanchez show an average fall of rain of over 6 inches per month, except for the period from December to April. For portions of the interior and western sections of the island there appears to be two periods of heavy rainfall—one in November, the other in spring. The western portion of the great central plain is much drier. Thorn forests begin west of the interior town of Santiago de los Caballeros, and huge cacti dot the plains of the northwestern Province of Monte Cristi.

Field work in Monte Cristi Province, 1929.—During the following year, 1929, from January to May, excavations were conducted at aboriginal village sites in Monte Cristi Province, formerly occupied by Ciguayans and other Arawak (Taino) tribes of the native Provinces of Marien and Samana. Three aboriginal sites were explored in the foothills southeast of the Dominican town of Monte Cristi, midway between the Haitian fishing village of Petite Saline on the Atlantic coast 20 kilometers east of Monte Cristi, and the Dominican pueblo of El Duro on the Monte Cristi-Santiago highway. The 1929 expedition was in continuation of archeological and biological investigations initiated in 1928, the immediate problem being a determination of the prehistoric culture and animal life of this semiarid province as contrasted with the humid eastern stretches of the island. Living quarters were established at the sisal plantation of Luis Richetti, whose plantation home is located not far distant from the first site to be excavated. Mr. Richetti was of great assistance in locating additional sites in the thick mesquite of the Saddle Mountain area because of his familiarity with the local geography of Monte Cristi Province.

The country west of Puerto Plata and Santiago is but poorly watered. The semiarid region includes practically all of Monte Cristi Province and the lower valley of the Rio Yaque del Norte. In the vicinity of the former aboriginal sites where excavations were undertaken, southeast of the town of Monte Cristi, a few houses of Dominican goatherds and beekeepers dot the 40-kilometer-wide area lying between the Rio Yaque del Norte and the Cordillera Septentrional on the north and east. Absence of any continuous

source of fresh water precludes extensive settlement except by those who are prepared to erect storage reservoirs. The first site explored, designated kilometer 2 by the writer, is south of the pueblo of Petite Saline, 10 kilometers inland from the Atlantic coast, and 30 kilometers north of the Yaque River, the sole source of fresh water in the lower valley for several months of the year. For a brief period following the rainy season, in December and January, springs supplied from water stored in the subsoil of the foothills afford a source of fresh water. During the remainder of the year a series of artificial reservoirs with earthen dams provided water for the aboriginal occupants of the village. Ruins of these reservoirs, although overgrown with thorn thickets, are readily discernible on the lower ground southeast of the village. The aboriginal practice of impounding water in reservoirs during the rainy season is continued by the few Dominicans who live in this semiarid region.

Moralis, one of the most careful of Spanish writers, observes that irrigation was extensively practiced in Xaragua, in Azua, in the lake region, in Yaquino, and in Bainoa. "In all these regions are fosses or trenches made of old time, whereby they convey the water in order to water their fields, with no less art than do the inhabitants of New Carthage and of the Kingdom of Murcia."

Kilometer 2 site includes six parallel rows of refuse heaps and kitchen middens extending 350 feet north and south. Ashes from the different aboriginal hearth fires form layers extending practically the entire length of each row. Each midden is separated from the next parallel midden by the distance of 5 to 10 paces. Cultural deposits of ashes and kitchen refuse in the average never exceeded a depth of 7 feet. Only a few inches of soil covered the middens.

Another archeological site, higher up in the foothills of the Silla de Caballo (Saddle Mountains) Range, near the present Dominican pueblos of Manantial and Las Aguitas, is much larger than the former Ciguayan village site, designated as kilometer 2. This station undoubtedly owes its origin to the presence of fresh-water springs. A portion of the site extends to the summit of the highest hills of the region at an elevation of more than 300 meters. Many of the higher hills of the Monte Cristi Mountains have at their summit small culture deposits of conchs and shells of other mollusks intermingled with layers of ash from aboriginal hearths.

The net results of the exploratory work in this region are of value to biologists in determining the fauna of the area, much of which has become extinct since colonization by the Spanish. Mammal, bird, fish, and reptile bones occur in quantity throughout the middens. The relative proportions of fish and mammal bones establish without a doubt that the aboriginal occupants of the Monte Cristi sites were primarily fishermen. This is significant, as the sites are

10 kilometers distant from salt water and 30 kilometers from the Yaque River. Furthermore, in the middens were found bones of the West Indian manatee or sea cow, some of which had been shaped into picks and primitive adzes or hoes. Not only bone but coral and shell were used as tools and implements by the aboriginal occupants of the area. In fact, celts or adzes of conch shell (*Strombus* sp.) recovered by the expedition far outnumbered those shaped from stone. It would appear that the aboriginal fishermen of Monte Cristi established their villages so far inland because of their need for fresh water. They found it easier to carry sea food 10 kilometers inland than to carry water to the seacoast. In grating the roots of the manioc to produce flour for bread making, slabs of brain coral (*Meandrina* sp.) were used as triturating surfaces. Many such improvised graters were uncovered at each of the sites investigated. Other uses of coral included pestles and figurines probably used as religious objects (zemis). With regard to implements and decorative objects generally, shell and bone appear to have been the favored media. The extensive use of shell and bone in preference to stone or wood appears to have extended along the entire northern coast of Santo Domingo. Uniformity in the coast culture of northern Santo Domingo as contrasted with that of other sections of the island is substantiated in pottery finds from the same area. Many types of vessels and shards are identical with those from Samana, both as to form and design, although a certain similarity is to be noted with pottery from northern Haiti. The porous, sand-tempered ware of Samana was not found in the Monte Cristi middens. The culture identity prevailing in prehistoric times along the entire northern coast of Santo Domingo apparently did not extend westward much beyond the valley of the Lower Yaque. In northern Haiti an Arawak culture identical generally with that of the Central Cordillera prevailed. The Ciguayan Indians of the Dominican northern coastal area must therefore be considered as culturally distinct from the typical Arawak of the island as a whole and of Porto Rico.

This conclusion was vividly illustrated to the writer by explorations conducted after concluding work at the Monte Cristi sites. A visit was made to the foothills of the Central Cordillera near the Haitian border in the vicinity of the headwaters of the Chaquey River and the border town of Dajabon. The writer was accompanied by Señor Andres Socias, of Copey, who discovered petroglyphs on some large bowlders on the banks of the Chaquey River near the village of Mara. Señor Socias has through many years of effort assembled a large collection of stone implements, pottery, and ceremonial objects associated with the religious rites of the Indians of northern Santo Domingo and Haiti, that is, of the

aboriginal Province of Marien, whose chief, Goacanagaric, befriended Columbus during his first voyage.

One of the most striking differences between aboriginal culture of the Ciguayan Indian of Samana and of Marien west of the Yaque River is the small number of implements found in Ciguayan territory having to do with the maize culture. In Señor Socias's collection from Marien were several mealing stones, the so-called metate and mano, for triturating flour from maize. In the Monte Cristi sites a few of these mealing stones were recovered, indicating that the growing of Indian corn was understood. Although, as mentioned before, devices for grating cassava were found in quantity, in Samana no such metate fragments or manos were seen. Also many flat circular earthenware slabs for baking cassava bread were seen at every hearth place in Samana and in Monte Cristi.

The ceremonial life of the culturally more advanced Arawak tribes of the central and northwestern portions of the island is characterized by the use of so-called ball courts, as in Porto Rico, where the chief game was one played with a ball. According to Oviedo, every village had a cleared space for playing the game of batos, surrounded by stone seats, but for the caciques pretty carved stools were placed. The ball was made by boiling the roots of certain plants. From the meager description in historical accounts, but with little definite evidence for the assertion, it has been supposed that this substance was rubber. Herrera states that gum of a certain tree furnished the material of which the ball was made. Sides were taken with 10 to 20 to each side; the ball was struck by the head, neck, or shoulder, but most frequently by the thighs or knees, and must not be permitted to touch the ground. If it falls, then the side which has allowed it to do so loses the game. Men and women never played together.

Field work in La Vega, Azua, and Santo Domingo Provinces.—During the months of January to May, 1930, the third consecutive season of archeological work in Santo Domingo was undertaken. As in preceding years, the work was made possible through the generosity of Dr. W. L. Abbott, who had previously conducted biological investigations in the mountainous interior of the Dominican Republic, principally in the high mountains surrounding Constanza Valley, but also at El Rio and at Jarabacoa in the Province of La Vega, and on the southern slopes of the Central Cordillera in the Province of Azua.

The season's work opened on the south coast, at the little Dominican village of Andres on the Bahia de Andres, an arm of the Caribbean, situated approximately 35 kilometers east of the capital city of Santo Domingo in the province of the same name. The

writer first became interested in what had been reported as an Arawak burial ground at Boca Chica, a Dominican town located about 2 kilometers down the bay of Andres east of the village of that name, when viewing, in March, 1929, the collection of Señor Andres Socias, of Copey, Monte Cristi Province. In that collection was an earthenware vessel somewhat different from the usual type of pottery from the north coast of Santo Domingo. Señor Socias had obtained the vessel several years previously as a gift from a friend residing at Boca Chica. Somewhat later in the 1929 season an American engineer interested in the sugar industry of the south coast remarked to the writer that an Indian cemetery at Boca Chica (Andres) had been discovered by Mr. Thomas Howell, of New York, the president of the Compañía Azucarea Boca Chica. Mr. Fox, the resident manager of the concern, during the absence of Mr. Howell, kindly granted permission to carry on investigations for the National Museum on the property of the sugar estate directly in front of the sugar warehouses, where most of the finds were being made. Local officials of the Dominican Government granted permission to explore within the confines of the adjoining village of Andres. During the time spent at Andres, living quarters were supplied by the Compañía Azucarera, the officials of which assisted the undertaking in every possible manner.

The former aboriginal village site at Andres extends along the coast all the way from the native village of Boca Chica, at the eastern end of the Bay of Andres, through the village of Andres near the western end of the bay, where it terminates abruptly in front of the warehouses of the Boca Chica Sugar Central. Directly fronting the warehouses and refinery buildings is a large sand spit projecting out into the bay and covering a depth of 3 to 10 or more feet the coral rock which underlies the entire area. Except for the sand spit, there is but little soil covering the coral and the unusually extensive shell midden characterizing this ancient Arawak settlement rests directly on a bed of coral rock. This sand spit was utilized by the former aborginal occupants of the region as the only possible burial ground within an extensive area along the southeastern Santo Domingan coast. It was here that they buried with their dead many bowls, food dishes, and water jars.

Many years ago this site was first made known to Dominicans through the casual finding of Indian skulls or of an occasional pottery food dish washed out by action of the waves. No systematic excavation was made at this point, however, until 1928, when the owner of the Boca Chica Sugar Central, while excavating for a new sugar warehouse, uncovered many skulls, skeletons, and accompanying pottery vessels. Before the owner's attention was directed to

these finds a large number of earthenware vessels had been destroyed by the laborers. When informed of this, Mr. Howell, the owner, very carefully preserved all of the remaining specimens uncovered later. In 1929, at Mr. Howell's request, the American Museum of Natural History in New York City detailed Doctor Shapiro to visit the site. Doctor Shapiro obtained a fine collection of skulls, some entire skeletons, and a collection of earthenware vessels recovered along with the skulls from excavations made at the Indian cemetery directly in front of the warehouse.

Somewhat later Dr. Narciso Alberti, head of the National Museum of the Dominican Republic at Santo Domingo City, went to Boca Chica and collaborated with Mr. Howell in further excavation on the sandy beach in front of the sugar warehouse. Doctor Alberti obtained a remarkably fine series of earthenware vessels and a large number of skulls.

In 1930 the writer proceeded to Andres, hoping to learn more of the culture stratification in the village site proper. He did not hope to find any extension of the cemetery beyond the confines of the Boca Chica sugar estate. On investigation it was found that the cemetery projected beyond the eastern boundary line of the estate and underlay all of the native village of Andres, extending even beyond this compact little village about 500 feet to the east. It was this discovery that made it seem advisable to undertake anew archeological excavations at several test places, even though previous excavations had been carefully performed. A large collection both of skulls and of earthenware vessels resulted.

The site is perhaps the most extensive of any West Indian archeological station known at the present time. More skulls and earthenware vessels have been recovered intact by the different institutions represented than from all of the known sites in the West Indies combined. There is a remarkable uniformity throughout, both as to midden deposits and burial finds. All of the skulls appear to have been primary burials and have apparently not been disturbed. Burials are flexed, with knees projecting upward under the chin and arms folded on the chest, the entire skeleton being found either squatting in an upright position or on one side, apparently with no regard as to orientation in the direction of any one of the cardinal points. Each of the burials was accompanied by one or more earthenware food dishes and water jars; a favored position for the water jars being one at either side and the food dishes in a row directly in front of the flexed skeleton. Pressure from the sand had frequently crushed the larger earthenware vessels, particularly the large water containers, and frequently the skulls as well, but just as often it was observed that while the

skeleton itself had disintegrated the earthenware vessels and the skull were practically intact except for those quite near the beach where the sand remained moist at all times, due to the burial being below the level of the water pan. Even here below the tide level of the bay some of the material was recovered intact.

The following observation of Fewkes is of interest in comparing what are undoubtedly Arawak burials with similar practices in the Lesser Antilles:

> The ancient Antilleans buried their dead in a contracted (embryonic) posture, often in the floors of the houses; and we have an early record of a chief of Dominica who was buried in the middle of his dwelling, after which the house was abandoned. The natives were accustomed to make the grave in the same house where the person died, or in a new house built for that purpose. The dead were sometimes seated on their heels, the two elbows on the two knees, the head resting in the palms of the two hands. The author has found burials in the Carib cemetery at Banana Bay, in the island of Balliceaux, in the same position as above described by Labat. It was customary to deposit mortuary offerings in the graves, which accounts for the pottery and other objects found by the author in the Balliceaux cemetery.[20]

After making a representative collection of typical anteriorly deformed Arawak crania through excavating on the sand spit cemetery in front of the sugar warehouse and later within the village of Andres, studies were made of the midden deposits. These consisted for the most part of a dense layer of conch shells (*Strombus pugilis* L.) intermingled with fish bones, leg bones and carapaces of turtle, and of mandibles of several species of crab. The midden deposits resting on the solid coral never exceeded 5 feet in depth. A thin stratum of soil of the thickness of a few inches covered the midden. No stratigraphic changes within the midden were apparent at the places where test excavations were made.

The next project to be undertaken during the 1930 season was in the nature of an archeological reconnaissance in the high mountain valleys of the Provinces of La Vega and Azua.

The mountainous backbone of the island, the Cordillera Central, starts from low hills at the extreme east of the island in the Republic of Haiti, rises gradually toward the west, and attains its greatest height in the west-central part of the island. The range is widest in the middle, where it attains a width of 130 kilometers, extending from a point near Santiago de los Caballeros to the Province of Azua.

The range appears as a jumble of ridges and peaks, with the occasional interpolation of beautiful little flat-bottomed valleys. There are outcroppings of many different kinds of rocks—effusive and intrusive igneous rocks, schists and other metamorphics, and a great

[20] Fewkes, J. Walter, Relations of Aboriginal Culture and Environment in the Lesser Antilles, Bull. Amer. Geogr. Soc., vol. 46, no. 9, p. 673, 1914.

variety of sedimentary rocks, including coral beds in the vicinity of Loma de Rio Grande south of Constanza.

The route across the Cordillera Central leading from Santo Domingo City by way of the carretera Duarte through the town of Bonao terminates at La Vega. Bonao, a town of 1,000 inhabitants, is the largest settlement between Santo Domingo and La Vega. It is situated in an alluvial flat bordering the Rio Yuna, which is in that vicinity only from 1 to 2 meters deep. Cacao, tobacco, coffee, kidney beans, plantains, and other fruits are grown in the valley. The divide of the Cordillera Central is crossed by the highway at an altitude of 430 meters between Sabana Grande and Bonao.

The carretera Duarte is a well-improved automobile highway and even from the seat of a speeding automobile one obtains a view of the surrounding countryside remarkable for its native and undeveloped beauty. La Vega is reached all too soon and the scurrying about for a light car to take one on the first lap of the journey into the heart of the Cordillera has its beginning.

The goal of the journey, the valley of Constanza, is well known to naturalists from the days of Humboldt, Schomburgk, and Gabb. In recent years Abbott, Wetmore, Ekman, and others, including Wythe Cook of the survey party conducting a geological reconnaissance of the Dominican Republic, have carried on investigations in their respective fields along the Constanza trail.

One branch of this trail starts at Santiago de los Caballeros and passes southward along the east side of the Rio Yaque del Norte to the town of Baitoa. Later the Santiago trail is united with the La Vega branch of the Constanza trail, which is passable for light automobiles and trucks as far as Jarabacoa. Much work remains to be done in the way of bridge building and grading. The Rio Yami must be forded, as must also the Rio Jimenoa, before the immediate goal, the town of Jarabacoa, is reached, where the automobile is discarded for pack saddle and mule train.

Before reaching Jarabacoa, from the summit of Loma de Joa one can look northward across the wide valleys of Rio Yaque far to the north, vistas of the Cibao Valley and the Monte Cristi Range looming up beyond it. The south side of Loma de Joa is covered with an open pine forest, which gives way, near the base, to plant types more characteristic of the Tropics, such as the royal palm, guava, and wild orange. In the lower, damp places the rose apple (*pomarrosa*) flourishes in great luxuriance. Between Loma de Joa and Rio Jimenoa there are low hills and several small streams.

Jarabacoa, a compact little town of perhaps 1,000 inhabitants, is built on a terrace on the left bank of Rio Yaque del Norte at an altitude of about 480 meters above sea level. A well-defined higher

terrace begins at the edge of the town, and corresponding terraces can be seen on the opposite side of the river. El Barrero (altitude about 1,000 meters) dominates the view on the south. From the top of hills near Jarabacoa can be seen the rounded peak of El Rucillo, and far away to the north the massive profile of the Cordillera Septentrional.

After leaving the valley of the Jimenoa and the proximity of Jarabacoa, the climb up the steep and rocky defile of the Arroyo Baiguate brings one to the top of El Barrero. The narrow trail, following the crests of ridges that buttress the narrow mountain crest, descends the southern slope and again ascends to El Paso Bajito and again encounters the Rio Jimenoa, which is forded at El Rio. Here, in the narrow flat valley, may be seen aboriginal earth works resembling very much those to be described later from Constanza.

After leaving El Rio one must ascend another mountain crest, the Loma del Hato Quemado, which marks the watershed between the waters flowing north into the Jimenoa and Yaque del Norte and those flowing east into the Camu and Yuna Rivers, which empty into the Bay of Samana far to the east.

Circling along the crests of ridges in a general southerly direction, the trail descends to the narrow valley of the upper Tireo River, a tributary of the Yuna River. Several aboriginal earthworks of the Constanza type were observed. There were also observed scattered groups of the peculiar natural mounds, resulting from exfoliation, but which are locally known as Indian burial mounds.

From the valley of the Rio Tireo the final ascent up the flank of the Loma del Valle brought into view the panorama of the flat valley of Constanza framed by encircling mountains. The valley occupies an area of 30 square kilometers and lies at an altitude of 1,100 meters above sea level. Two tiny rivulets, the Pantufle and the Rio Constanza, drain the valley and unite to form the Rio Limon at its southeastern corner. The village of Constanza is sheltered under towering mountains at the northeast corner of the valley. Near by is the largest of the series of aboriginal earthworks that also appear elsewhere at several parts of the valley. Southwest of Constanza the department of agriculture maintains an experiment station for raising products of the Temperate Zone. Constanza is a forlorn village of several score of houses, and has few attractions to the outsider, except its beautiful location.

Living quarters were obtained in the house of Señor Felix Matias, a kindly Dominican whose aid in obtaining permits to carry on excavations was much appreciated and is here gratefully acknowl-

edged. Laborers were readily obtained, and within a few days a system of procedure was developed. Two apparently "natural born" archeologists, Antonio M. Garcia, the local weather observer for the Dominican Government, and a campesino who answered to the simple name of Pong, began a systematic survey of the surrounding mountains in search of caves or rock ledges containing Indian burials. In this they were quite successful. Their efforts yielded a large number of well-preserved crania and long bones, though an entire Indian skeleton could not be recovered, due to partial disintegration of the surface burials.

In the rock ledge burials on the flanks of the Loma la Cumbre between the Rio Tireo and the Jimenoa; on the slopes of Loma de Rio Grande, Monte Culo de Maco, Loma Rucilla or Pico del Yaque, Loma Chinguela, and Monte Cucurucho, and of the hills in the more immediate vicinity of Constanza, careful search was made for burial offerings. A few stone beads, pendants, zemis, fragments of burial pottery, and a small number of intact earthenware vessels were discovered in juxtaposition to the skeletal remains.

Under the tutelage of a Dominican whose family name is forgotten, but whose given name of Josecito seemed particularly appropriate, the writer began a search within the valley of Constanza for a domiciliary midden sufficiently well preserved to yield cultural material for stratigraphic study. Pottery shards were reported from many places in Constanza Valley and the upper valley of the Tireo. Upon investigation, the culture deposit invariably proved to be merely a few inches in depth and unsuitable for excavation. Opportunity was seized on these reconnoitering trips to purchase any archeological specimen offered. Soon the entire countryside became engaged in commercial archeology, but the ideal midden deposit remained undiscovered.

Many natural formations resembling small circular artificial earth mounds, said to be Indian burials, were reported from widely separated locations, but on investigation they proved to be unusually exfoliated masses of rock and pebbles in circular heaps from 5 to 8 feet in diameter, projecting from 1 to 4 feet above the surrounding soil level, under which lay rock fragments and pebbles similarly exfoliated and disintegrated. The regularity of these natural mounds, dotting a flat valley floor in a striking way, is remarkable. The proof that they could not be aboriginal burials was near at hand if one was provided with pick and shovel. Test holes were made of these peculiar formations at Manabao, in the valley of the Rio Tireo, and in the valley of Constanza, on the otherwise level valley floor between the village of Constanza and the streamlet named "Pantufle."

Sir Robert Schomburgk reported in an article in the Athenaeum in 1851 the presence of an Indian cemetery in the valley of Constanza and offers as evidence the following data: "Near by is a burial ground toward the foot of the southern mountains of the valley—one hour of brisk walking through pine forests brought us to a rivulet. Here were earthworks of semicircular form. Crossing the brook were burials covered with greenstone in circular form bounded by the mound, the rivulet, and the pine forest." Obviously Schomburgk did not dig into these mounds, as he makes no further mention of them. His observation has, however, been recorded on his map of the Dominican Republic, and for many years thereafter all maps of the country indicated the presence of an Indian cemetery in the valley of Constanza. Near by, just above the waterfall locally known as El Chorro, southeast of Constanza village, begins the rocky crest of a hogback, a long upward-sloping hill, under the scattered comb of which Alberti had recovered several deformed Arawak crania. The writer was also successful in recovering skeletal and cranial fragments along with pottery offerings from under this cyclopeanlike outcropping of faulted rock.

The culturally more advanced Arawak of the mountainous interior of Santo Domingo deserve to be classified with the Mississippi Valley mound builders, even though they did not construct burial mounds. Many artificial structures of earth were erected by them, principally in the uplifted valleys of the northern central mountain ranges of Santo Domingo. Some of these mounds, varying in height but never exceeding more than a few feet at most, are round, others are rectangular. Most of them, however, are in the form of two parallel embankments. Four series of parallel embankments were observed by the writer in the valley of Constanza. The average height is from 3 to 10 feet, with a width of 20 feet, in transverse section at the bottom. The embankments are remarkably uniform, averaging slightly less than 300 feet in length, and occurring always in parallel. Three of the embankments were trenched, and it was found that in every case the earth of which they were composed had been assembled from near-by surface soil. The mounds are free from rocks and contain practically no artifacts, except occasionally a broken celt, hammerstone, or broken shard from some water vessel or food bowl. At their bottom, beneath the embankment at a level with the adjoining terrain, we again find the same soil that normally appears elsewhere at a depth of a few inches to 1 foot, showing that the entire structure had been laboriously piled up by the natives with earth from near-by fields for some unknown purpose.

Their use as cemeteries must be excluded, as nowhere in the embankment is there any indication of burials. The old theory, ad-

vanced in explanation of the circular Porto Rican juegos de bola or ball courts, that they were used as a sort of a stadium or amphitheater during native ceremonials and athletic contests, is perhaps adequate in explaining their presence. As they are always in parallel it would seem that the sports or ceremonies took place in the cleared space between them. This space is normally about 150 feet wide, or about half the length of the parallel mounds. The first mention of this form of Dominican aboriginal mound was by Schomburgk in an article in the Athenaeum in 1851.

Another form of mound was observed by the writer elsewhere in the island, namely, a circle of stones near the headwaters of the Chaquey. Here a circle of upright stones 300 feet in diameter surrounds a flat space overlooking the valley of the river. Two entrances to this court are placed at opposite sides of the circle. At the exact center stands a plain stone pillar 2 feet in height. A similar circle had been erected by the Arawak at what is now known as San Juan de Maguana in the Province of Azua. The ruins of this circle were observed by the writer and the impression immediately gained is that of some prehistoric race track, modern even to the placing of a stand for the judges. Of course, this similarity is purely fantastic and the use to which the structure had been put in prehistoric times is perhaps similar to that of the parallel embankments in the valley of Constanza. Sir Robert Schomburgk described this circle at San Juan de Maguana in 1854. It has been carefully preserved by the Dominican Government and is readily accessible by automobile on the main highway from Port au Prince to Santo Domingo City. A similar stone structure in the form of a circle has been described from several South American sites, the nearest being those in British Guiana. Similar circles from ancient Peru were described by Humboldt, and by C. Barrington Brown from British Guiana.

Don Miguel Rodriques-Ferrer in the Compte Rendu of the 1881 International Congress of Americanists, meeting at Madrid, refers to two localities in the eastern part of Santiago Province, Cuba, where there are circles, squares, mounds, and inclosures. These, he says, resemble in general character those of the Mississippi Valley. They are also described in his book, Naturaleza y Civilización de Cuba, Volume I, Chapter III.

In an article by C. Barrington Brown entitled "Indian Picture Writing in British Guiana" the observation is made that a batey or ball court occurs in the Pacarima Mountains in Venezuela.

The nearest approach to ruins of this description in prehistoric Porto Rican structures are inclosures surrounded by aligned stones, set on edge, which occur in the less-frequented parts of the island.

These inclosures are square or rectangular and their floor level is slightly below the surrounding surface. The stones forming their boundary walls are roughly hewn and sometimes bear pictographs, in one or two cases the upper end being rudely fashioned to represent the head or body of an idol. The structures are called "cercados de los Indios" or "juegos de bola," from the belief that they were used in a game of ball called "batey." Oviedo described this ball game, saying it was played in inclosures outside the pueblos, where there were seats for the cacique and the spectators.

We know that the Borinqueños had elaborate mortuary dances called "areitos" which occurred at the burial of a chief or cacique. An inclosure at Utuado on the left side of the road to Adjuntas is of the type where such ceremonial dances might have taken place.

ELEMENTS OF FORM AND DESIGN IN SANTO DOMINGAN ABORIGINAL POTTERY

The making of earthenware forms in North, Middle, or South America is generally coincident with the cultivation of maize and cassava (yucca in the West Indies). In South America the pottery-making area is a continuous one, extending from the Isthmus of Panama southward along Pacific and Atlantic coasts approximately to latitude 40° south. This distribution leaves without a knowledge of pottery a group of tribes occupying the colder regions of the Patagonian pampas, inhospitable Tierra del Fuego, and on the west, the humid southern Chilean coast. Apparently these tribes did not establish contact with the higher cultures of the Andean highlands far to the north. Another area in eastern Brazil is occupied by isolated tribes whose knowledge of pottery manufacture is meager. An enumeration of South American tribes who possess no knowledge of pottery would be premature at this time, but the rule holds that where maize production and the utilization of cassava products is nonexistent pottery production remains undeveloped. The limits just mentioned as marking the boundaries of ceramic productivity in South America are also the southern boundaries of maize or cassava production. Isolated tribes without pottery, whose culture is but sketchily known, and that occupy territory within the pottery area of Peru and Chile, may represent older culture strata dating back to a time when pottery was more generally an unknown primitive industry in the New World.

Coincident with pottery distribution in aboriginal South America within the limits of maize and cassava culture is a pottery area of aboriginal North America which is, for the most part, coextensive with maize culture. We have in North America four distinct areas of primitive pottery production. Even the maize-producing, pottery-making tribes are separated by an "ethnological sink" extend-

ing, according to Swanton, far into northern Mexico and reaching from the Gulf of Mexico to the headwaters of the Snake River in northwestern United States.

The possibility of contact between the culture of the Southeast and that of Mexico has been artificially enhanced by confounding and identifying the area of ancient Mexican civilization with the territory of the modern Republic. But, while the latter stretches northeast as far as the Rio Grande, the Aztec or Mexican State proper was more than 400 miles southwest of that river in a direct line. There were other of the so-called civilized tribes less distant, but the nearest of these, the Huastec, were still more than 200 miles south of the Rio Grande. The intervening territory was occupied by numerous small tribes without any pretensions to an advanced culture and so difficult to subdue that, although the Huastec were conquered by Cortez early in the sixteenth century, these wild peoples did not succumb until well along in the eighteenth. Populations of an identical character and status extended beyond them as far as the Caddo—the Coahuiltecan tribes, the Tonkawa, and the Karankawa—described tersely on the maps as wandering and cannibal people, and pictured by Cabeza de Vaca, the companions of La Salle, and later explorers of all nationalities as exceedingly crude and barbarous. To find the like in North America we should have to go to the cold northern interior, or the arid districts of the Great Interior Basin and Lower California. And this cultural "sink," to borrow a geological term, extended considerably over 600 miles in a direct line from the Huastec boundaries to the nearest Caddo towns. Measuring along the coast, which might be thought by some a more natural line of movement, it would be 50 or 100 miles farther to Vermillion Bay. The nearest points between these two cultures were thus as far apart as Washington and Chicago or Columbus and Kansas City. If any Southeastern cultural features came by this route, they must, therefore, have been transported for this immense distance before establishing themselves again, so that even in the case of single cultural elements, with which we are now concerned, the problem must be recognized as a serious one.[21]

Thus we have, first, an eastern pottery area bounded by the Gulf of Mexico on the south, the Atlantic Ocean on the east, Labrador and the sub-boreal regions of northern Canada on the north, and the plains area and adjoining Rocky Mountain region on the west; second, a middle American area, which extends all the way from the Isthmus northward to the headwaters of the Colorado River, forming a wedge of middle American culture extended northward by pueblo building and allied tribes.

Tribes of the Pacific coast territory north of central California, also of the basin of the Columbia River and tributary streams, the forested, island-studded coast of British Columbia and of southeastern Alaska, also of the entire Canadian sub-boreal region unsuitable for the production of maize, did not develop the manufacture of aboriginal pottery, although the western tribes occupying the area reached a remarkable degree of attainment in other primitive industries, notably in basketry, and in the carving of stone and wood.

[21] Swanton, J. R., Southern Contacts of the Indians North of the Gulf of Mexico, 20th Ann. Congr. Int. Americanists, pp. 53–59, Rio de Janeiro, 1924.

In the case of the plains tribes, devoid of pottery for the most part, geometrical art was developed by means of painting and quill working.

In a general way there is a duplication of earthenware patterns of South and of North America. With the centers of highest achievement in pottery production in the highlands of Central America, Mexico, and in Peru, and with the gradual fading out of the industry toward the nonagricultural areas, there can be no thought of a direct migration of the industry from without, as from the Polynesians who did not make pottery, and more particularly from northeastern Asia, where the making of pottery is limited to a few tribes. Pottery making, so far as the Americas are concerned, must, therefore, have developed as an endemic American industry. Just where it began, perhaps at a dozen centers, remains as yet a matter of future chronological study. The whole maize-cassava-pottery culture complex is of native American origin.

In the extreme northwest of North America the Eskimos have developed a distinct pottery in association with Siberian forms and technics. The area of pottery distribution on the North American Arctic coast extends as far east as the northeast cost of Hudson Bay. In Asia, although little is known archeologically of the distribution of the Arctic-Eskimoan form of pottery, we know it to be fashioned by the Yuit just across the Bering Strait, and in the region surrounding Cape Bathurst. Eskimo pottery appears to be distinct as to paste, tempering, and shaping technic from the generally known types of coiled pottery fashioned in the maize and cassava areas of America. Although use of coiling ribbons of clay is not infrequent the usual Eskimo method is to work the vessel from a solid mass of earth previously prepared with a tempering of hair, seal blood, ptarmigan feathers, marsh grass, or similar materials. The walls of the vessels are thick; the forms include shallow, hemispherical bowl types, also occasionally tall, wide-necked containers almost cylindrical in form, with flat bottoms. The shallow bowl forms are frequently used as lamps, and invariably have on the inside etched or applied geometric devices in the form of crosses. Eskimo pottery is never intentionally baked, merely being allowed to dry, later to become saturated with oils and fats. It is exceedingly fragile.

Wissler erroneously notes that the pottery of the Mandan and Hidatsa of the Dakotas is related to the Eskimo pottery type both in technic and in origin. Mandan-Hidatsa pottery-making technic does vary somewhat from the generally employed pottery technic of the eastern Indians. It is, however, more probable that these maize-producing tribes of the northern plains are marginal to the

maize-pottery area of the Mississippi Valley. To this group belong the Pawnee and other southern plains groups.

In the West Indies pottery differs little from that of continental North or South America with regard to the usual shaping technic, which consists principally in the horizontal joining of ribbons or coils of clay of such diameters as are necessary in shaping the walls of the vessel proper. Free-hand molding of applied symbolic and decorative embellishments is likewise an elementary potter's technic. In Santo Domingo, as in the Southeastern or Gulf States, these were usually luted onto the side walls of the vessel as handle lugs, apparently for ornamental purposes. Applied decorative embellishments, together with free-hand incised decorative designs etched on the upper portion of the outer walls according to distinctive patterns, constitute the characteristic elements of the aboriginal pottery design of the southeastern and Greater Antillean pottery areas.

It has frequently been stated that in the aboriginal embellishments of Santo Domingan pottery vessels applied figurines are for the most part anthropomorphic, while those from the Lesser Antilles are zoomorphic. This distinction vanishes as we become better acquainted with the limited faunal species native to that island. What had formerly been supposed to represent a symbolic or mythological human character is nothing more than a somewhat rude but faithfully executed copy of what the primitive potter saw when he chose the native rodentlike mammal, bats, or birds as models for his decorative designs. A distinction, however, that is clear-cut and far-reaching is in the use of painted geometric designs applied on pottery of the Lesser Antilles. Characteristic of the Lesser Antilles also are certain details of modeling of the vessel itself, as thickness of walls, rim, or peculiarities of form; also details of applied decorative devices, as the massiveness of modeled life forms, and detail in features, as bloated faces and bulbous excrescence on nose.

In Santo Domingo variation was obtained in surface coloring through the application of slips, or by afterwards washing with white clay (kaolin). In the Virgin Islands we have, apparently, two types of aboriginal pottery, one favoring the Porto Rican-Santo Domingan type, and another resembling the forms and surface finish of the Lesser Antilles. Fewkes and De Booy do not agree in the interpretation of their respective finds from the Virgin Islands.

In the Santo Domingan wares the paints and slips applied before firing are fixed, while the white of the kaolin is readily removed by washing the vessel in water. Many of the color distinctions are accompanied with difference in the paste, in the degrees of thoroughness of its pulverization, in the thickness of walls, smoothness

of surface finish, decorative design and symbolic embellishments, and to a lesser degree, in form. On the basis of several combinations of these characteristics we may speak of (*a*) unpainted ware; (*b*) painted and slipped ware. The unpainted ware may again be classified as terra cotta or as black incised, while the painted and slipped ware readily falls under the classification suggested by the coloring of the inner and outer walls as red, white, salmon, maroon, and polychrome. It will be noted that this classification of the pottery of the West Indian island Arawak is less complex than is that used by Holmes, MacCurdy, and others in describing the ancient pottery of Panama and Central America.

It has frequently been asserted that pottery made by the Caribs of the Lesser Antilles was superior to that fashioned by the island Arawak with respect to firing, slips and paints, paste, and surface finish. We now have a more comprehensive knowledge of aboriginal pottery forms from Santo Domingo and find the statement no longer adequate. If we include the polychrome fragments from southwestern Porto Rico, we must now rank slipped and burnished aboriginal pottery from eastern Santo Domingo and southwestern Porto Rico as a highly developed, distinct pottery type on a par with the superior painted wares of the Lesser Antilles. The painted and slipped wares of Santo Domingo are less common than the more friable and granular terra cotta, unpainted ware, which occurs throughout the island, while the white painted gray ware, for example, is found only in Monte Cristi.

In the aboriginal pottery of Santo Domingo tempering materials are uniformly of small particles of sand, mica, and crushed fragments of steatite and quartz or shell, and occasionally rounded pebbles or miscellaneous foreign material.

Pottery vessels are less ornate and varied in detail than are corresponding forms from Central America, but are more developed than the ancient thick-walled vessels from the coast of Venezuela and the lower Parana Valley. The painted wares from Venezuela, the Guianas, and Brazil are, on the contrary, a recent development and bear slight resemblance to Antillean earthenware. West Indian Arawak vessels from the Greater Antilles are at once distinguished from Central American forms and to a lesser extent from Carib forms in the Lesser Antilles by their flat or slightly rounded bottoms, and by the lack of support flanges, legs, or deep annular bases. Then, the large, thick-walled, globular urns or general utility vessels, such as the large urns and containers from the lower Amazon, are lacking; most of the Santo Domingan forms being fairly thin walled and small in size, although the terra-cotta group has a coarse paste and large vessels of this ware are frequently thick walled.

Food pots, mostly terra cotta or black incised ware, are like those from prehistoric tropical South American lowland tribes, oval to hemispherical, with straight, incurving, or outcurving margins. A characteristic type is the shallow terra-cotta bowl of large circumference with incurved margin and flattish or rounded bottom. Two unique forms may be seen (*a*) in the rectangular vessel with scalloped rim, in which raised sections alternate with correspondingly depressed rim areas; and (*b*) the oblong, or elliptical boat-shaped vessel with its depressed lateral margin but elevated ends surmounted with outward or inward gazing figurine heads.

The unique development of Santo Domingan ceramics is especially marked in the decorative designs. Decoration is ordinarily by incised lines or by applied molded figures in relief. None of the figurine heads, so characteristic of West Indian potter's art, are cut in intaglio as in Florida. Intaglio designs representing figurine heads do occur, however, on water bottles from Monte Cristi. Another characteristic is that the figurines are free-hand moldings unlike the stamped Mexican analogues. Ordinarily, the figurine head is luted onto the vessel in pairs bilaterally near the margin of the vessel but in the red painted ware effigy figurine heads and other body parts are incorporated in the walls of the body of the vessel. Raised surfaces molded in zoomorphic designs and constituting an extension of the body of effigy bowls are shaped with the head of the animal extending from or near the margin on one side of the vessel and the tail projecting oppositely. Legs and arms flank the head, and other features, such as wings, appear as raised coils at the sides.

Knobbed pottery belongs to the painted or slipped red ware and apparently has a wide distribution in Porto Rico and Santo Domingo; it corresponds to the light yellow ware from Jamaica. Describing pottery forms from the Cueva de las Golondrinas, near Manati, in Porto Rico, Fewkes writes: "One of the specimens has two solid knobs on the rim; another is perforated just below similar knobs * * * there was an abundance of red ware." A similar type of pottery embellishment occurs on boat-shaped funerary vessels from caves near Kingston, Jamaica. In the Jamaican boat-shaped forms three buttons or knobs representing figurine heads are in series at the raised ends of the oblong vessels. Another design is in the form of a crescent-shaped ribbon of clay surrounding a central knob. This Jamaican yellow ware, like the red ware from Porto Rico and Santo Domingo, has very thin but well-fired walls. No characteristically Arawakan molded zoomorphic figurine heads appear in this group. A double-compartment bowl of painted red ware, with a dark brown slip on its inner surface, and with series of knobs, wens, and vertically applied ribbons representing life forms, was

excavated by the writer at San Juan on the north coast of Samana Peninsula, along with many other fragmentary vessels, similar as to firing, red slip or paint, form, and decoration. The walls of this and of other well-fired vessels of the painted red ware are thinner than are those of the unpainted terra-cotta pottery groups, the nearest approach being the unpainted, incised black ware. The introduction of a central diaphragm separating the vessel into two oval compartments is unique. The applied ribbons of clay, placed bilaterally in vertical positions on the outer walls near the margin, place this vessel within the classification of the knobbed decorated pottery which in Santo Domingo and Porto Rico always comes within the painted red ware group. Similar pottery has been reported from the Cauca River Valley of Colombia.

Earthenware water bottles with regularly formed tall cylindrical necks occur in the Greater Antilles only in Haiti and Santo Domingo. Similar Peruvian and eastern Gulf State forms, notably from Arkansas, are known. The specialized neck is surmounted with a knobbed rim. Occasionally a bulbous enlargement of the neck next the rim entirely replaced the decorative figurines which are usually luted on as decorative embellishments of the lower neck sector. This latter form of water bottle, slightly resembling a double gourd, but without other than occasional designs in decorative intaglio, usually belongs to the painted or slipped gray ware. The slip may be kaolin applied after firing, but ordinarily the creamy white paint is well baked on the smoothly polished surface. The white painted gray ware is usually further distinguished by a creamy white or granular paste, distinct from the black loamy paste characteristic of most of the earthenware from the island. The body of the Santo Domingan water bottle is spherical, having been shaped by coiling and hand modeling, aided with a calabash fragment or conch shell spatula, and flat polished pebbles.

The effigy canteen from Central America is occasionally duplicated in finds from Santo Domingan kitchen middens. This form is distinctive in that the facial features of the effigy or figurine head are luted in the form of balls and ribbons of clay on to the body of the vessel, which thus is incorporated in the design as the figurine head. This form of effigy canteen occurs on the Gulf coast of Florida, also in Mississippi, Alabama, and Louisiana. The neck opening of this Gulf coast bottle is greater than in Santo Domingan bottles, while the Arkansan bottles with tall, narrow cylindrical necks are not effigy vessels and frequently bear painted designs, an additional unlike feature.

A punctate decorative design, resembling punctate designs from Florida and the Gulf coast, appears as a common type of decora-

tive design on the north coast of Santo Domingo and to a lesser extent in western parts of the island. More or less deeply incised pits are regularly excavated in series of from one to six or more encircling bands appearing above the shoulder and below the lip of the hemispherical and globose vessel. This archaic design pattern appears also on South American earthenware vessels from Venezuela and Colombia. It is, however, entirely unlike most punctate designs from Florida. Other survivals of archaic decorative designs in Santo Domingan earthenware are several forms of eye molding so well described by Spinden from the valley of Mexico. An applied ribbon of clay, with central pit or slit, resembling a coffee bean or button, is a rare form. Two concentric circles with intervening ridges and central pit typify a more common type of lip eye modeling. A mere depression, or gouged-out area, also a central punctation or node surrounded with an applied ribbon of clay, are the most characteristic forms of eye representation. The banded punctate embellishments appear frequently on slipped ware, principally red or maroon, while the archaic forms of eye representation appear solely on unpainted wares. The use of clay buttons each with its central pit is apparently characteristic of the cruder type of unpainted Tainoan pottery.

A decorative panel of incised vertical, oval, or horizontal lines on the incurved shoulder ridge of earthenware is perhaps the most common conventionalized method of applying a decorative design on aboriginal pottery from Santo Domingo. Both vertical and horizontal lines are incised alternately in series. The incised lines may or may not appear regularly terminated with rounded pits and flat bottoms. Scarified decorative designs are frequently produced by scratching or even deeply incising the walls of the vessel with hachure figures before firing. The lines are roughly parallel, and appear without the terminal pits. This is the crudest type of incised design. Another form of crosshatching is produced by use of a paddle stamp or repeated use of an edged stick in horizontal, then transverse positions. The reticulated imprint somewhat resembles that of basketry fabric remains. Crosshatching and incised linear designs terminated with pits appear as embellishments oftenest on the black incised and on terra cotta unpainted wares. The use of a check stamp, or of a more elaborate pattern stamp as in Florida and elsewhere in the Gulf States, is not common to aboriginal Santo Domingan pottery.

Characteristic media of artistic expression, then, in the decorative designs embellishing aboriginal Santo Domingan pottery are threefold: First, application of paints or slips in white, salmon, red, maroon, and polychrome paints; second, application of geometric designs in incised paneling, including series of punctations, straight

lines, curves, circles, open and closed spirals on the incurved shoulder; third, luting on to the body of the vessel of bilaterally applied anthropomorphic or zoomorphic figurine heads on unpainted wares, also of knobs and wens in relief on the incurved shoulder of painted and slipped red ware bowls. Incised paneled designs and applied relief figures are freely used in combination, the plain knobbed or zoomorphic figurine heads being mounted near the rim of the vessel on the incurved shoulder of which appear geometric incised embellishments. The terminal pit occurs in conjunction with straight lines and incomplete circles, while the incised or applied circle appears with a centrally excavated pit or punctation.

The simplicity of the free-hand technic employed in shaping the molded figurine head is remarkable because of its effectiveness. Many of the figurine heads are clearly intended to represent turtles, frogs, snakes, iguanas, or lizards; birds, such as the parrot, owl, bat, pelican, and others; and mammals, as the jutia, monkey, and sea cow. Others are more conventionalized representations of the so-called "monkey" type. In this type the upper and lower parts of the clay head are molded to stand out in relief while the central portion is depressed. Horizontally incised lines of different lengths are cut transversely and are terminated with a characteristic shallow punctation, or are separated by a nasal eminence.

Anthropomorphic figurines may be plainly caricatures; a few appear to be portrait models in clay of definite individuals. Headdress forms are particularly striking. Representations of the turban, as on the archaic figurines from the valley of Mexico, and other forms representing feather and cloth headdresses and hair coiffures, are as characteristic as the suspended disc earring or ear plug appearing in anthropomorphic figurines as a figure 8. A more realistic ear modeling is noted in the distinctly animal figurines.

Generally it is impossible to recognize the species intended by the modeled zoomorphic figurine because of conventional distortions and omissions. Undoubtedly some of the figurine heads represent zemis belonging to an individual or family. Conventionalized presentations bespeak an old and deeply rooted culture, not necessarily a high culture, but one thriving throughout a long period of time in comparative isolation. It is possible that the personages or creatures represented are in part ceremonial and belong to the social and religious life of the tribe, as does the bat head in Mexico and the eagle design in southeastern United States pottery designs. Such representations need not necessarily bear any definite relationship to animal forms as described in natural history books.

There can be no exact identity in earthenware examples from the Gulf States with earthenware vessels from Santo Domingo unless similar available clays abound. Then, too, local developments in

native cultures in the areas compared perpetually made for successive changes in form and design. Individual idiosyncrasies must also be taken into account if we are to explain satisfactorily slight variations in the vessels from any one site, let alone from widely separated pottery-making areas. Availability of tempering materials of different sorts made for divergent usage as tribes occupied new homes or migrated from the coast to interior habitations. Contrasted with these forces making for lack of identity within one culture area or within two closely associated localities is a series of motives constraining the native potter to follow certain forms and conventional designs. The general level of culture as pertains to food habits would dictate the use of shallow bowls, the circular griddle, and perhaps other forms of food vessels. Ceremonial forms, as braziers, censers, ceremonial deity modelings, and incised or painted designs, depend on tribal religious development. The important motives dictated by religion and myth impelled the West Indian aborigines to shape a stone image of the same type ranging throughout the Bermudas and Greater Antilles.[22] Apparently it is the same with zoomorphic designs applied to earthenware vessels. We may easily trace certain modeled life forms, applied to earthenware vessels in a decorative way, from Cuba and Venezuela to Colombia and to Panama, likewise to the Gulf States and to the Huastecs of Yucatan.

The general culture level as pertains to the potter and his craft, however, dictated the use of incised ornamental design alike in the Guianas, the Antilles, and in certain of the Eastern and Gulf States. These are elementary, protean designs appearing also in modified form, of course, in the Neolithic in Europe, and on modern African wares. The Ashanti incised line terminates in shallow pits, identical with what has been termed unmistakable evidence of Santo Domingan aboriginal decorative design on pottery. (This design does not appear on shell, bone, or wood objects.) Then, too, there is the meandered scroll, incised on Antillean pottery wares, wood and shell objects, painted on pueblo pottery, also on South American wares. Scarification and crosshatch, manifestations of elementary decorative tendencies apparently cropping out wherever the primitive potter emerges with his craft, appear alike on Siberian, Alaskan, Floridian, Antillean, and Pueblo vessels.

The substitution of paint for incised technic is an advanced development and possesses chronological value, paint always appearing on late forms, never on early wares. It is this decorative feature that makes doubtful the antiquity of archaic figurines from the valley of Mexico. Painted archaic types from the valley of Mexico

[22] De Booy, Theodoor, Certain Similarities in Amulets from the Northern Antilles. Holmes Anniversary Volume, Washington, pp. 24–30, 1916.

and Central America reveal the potter's decorative art already past its beginning stages, and indicates an early differentiation from the Antillean unpainted pottery. Differentiation in earthenware production is synchronous with environmental peculiarities pertaining either to the physical surroundings or the spirit world with which the native potter has surrounded himself; similarities and identities in earthenware forms and designs appearing in proportion to the amount and type of general culture prevailing in the areas compared. In determining this quantum, common culture origins and degree of development, rather than tribal or culture migrations, are predominant.

Analogues may be found in design features and motives, in groupings, and in execution.

West Indian decorative designs are complicated groupings of applied and incised figures. The incised figures, again, are groupings of curved and straight lines, broken or continuous. Angular, rectilinear, curvilinear, concentric, crosshatch, punctate figures, all characteristic of Santo Domingan design, never proceed beyond the geometric, are never representative, symbolic, or ideographic, but are designed to fill in between spaced life motives in high relief.

Local South American pottery developments, as pyriform funeral urns; painted designs covering the entire outer surface walls; or tangas, those peculiar triangular-shaped earthenware girdle plates worn by aboriginal females in Amazonia; red painted ware from the Lesser Antilles, or even from the south coast of Porto Rico; free-standing supports or legs of Panaman bowls and braziers; loop handles; red slip or paint; polychrome designs; flat or rounded bottom; spouts; and details of modeling or shaping such as coiling, stamping, or indenting—all these are original local developments in form and design and subject to repeated invention. Identity in origin is, however, most likely in the case of certain other features of pottery form and design, such as the circular earthenware griddle; molded figurine heads applied bilaterally near the lip of the vessel; forms of eye, nose, and mouth modeling, specialized ear forms, headdress peculiarities; also such features of form as cylinder, boat or trencher shape; water bottles with figurines in relief applied to neck sector; such features as annular base; and luting on of figurines as free, hollow supports.

In Tainan wares the decorative zone is entirely above the pole of the bowl, or above the equatorial ridge. This decisive decorative element sets Santo Domingan wares apart from the modern painted pottery from Guiana, Venezuela, Amazonia, and Central America generally.

Modeled figurines common alike to the great middle American pottery-making area and the Antilles are representations of the frog,

crab, turtle, parrot, owl, alligator, snake, and aviform, mammalian, and life forms generally. The monkey and jaguar and other South American mammal forms give way in Antillean designs to the bat, the jutia, the solenodon, and the sea cow. Such details as coiled ribbons with centrally cleft buttons, eye symbols, paired handles, parallel line punctations, tail symbols, series of triangular or concentric circle incised arm and leg representations, indications of hand and foot, these are identical alike in prehistoric Panama, Colombia, and Santo Domingo.

A study of the decorative designs on shell, wood, terra cotta, and other objects of aboriginal provenience from Santo Domingo and elsewhere in the West Indies reveals many similar circle and dot, also angular spur, and concentric circle and dot, either in raised ribbons of clay or in incised or etched lines. V-shaped incised figures appear frequently on pottery vessels from the island Arawak. The inference is that the relief effect obtained by the alternate bilateral incised or etched lines and the raised wen or button with its circle and dot or the nucleated circle are but crude attempts at obtaining perspective and relief, unique but elementary to the designs incised or applied in characteristic manner on the more developed Antillean ceramics of a chronologically later period.

Disregarding surface finish and paints, earthenware vessels from Santo Domingo may roughly be grouped under three wares: Gray ware, terra-cotta ware ranging from brown to buff, and black ware. Each ware again apparently has an island-wide distribution, with certain centers of intensive development. Thus a sand-tempered terra-cotta ware is common to Samana and other southeastern provinces, gray ware and black ware to Monte Cristi and the central uplands.

If we include a consideration of the surface finish, the number of wares is increased and we may add as belonging to a separate ware those vessels revealing clear traces of having been treated with mineral clay wash or vegetable slip and those showing traces or panels of paint. The slipped ware occurs in salmon, white, red, cream, and maroon evenly applied to the entire outer and usually inner surface as well. Painted ware, on the other hand, is of two types, a characteristically marked red ware similar to that of southwestern Porto Rico, and polychrome, very rare in Santo Domingo, but appearing as a typical ware on the southern and western coasts of Porto Rico in the vicinity of Ponce. Polychrome designs on earthenware vessels from Porto Rico are geometric. So far as is known no examples of painted designs representing life forms have been found either in Porto Rico or in the Dominican Republic, or in other islands of the Greater Antilles. Not only is the painted

ware very limited in its distribution, but the number of specimens revealing painted surfaces is much smaller than are those that have been slipped or that appear in the natural colors produced in burning.

Unpainted pottery always appears in the natural terra cotta or brick, white, gray, buff, or brown colors which may or may not have been burnished or covered with some mineral clay or vegetable slip. The terra cotta unpainted ware, also sometimes known as the brown ware, is the most characteristic type of pottery both in Santo Domingo and in Porto Rico. The paste is less homogeneous, more porous, and shows rougher and cruder tempering than is true of the slipped or painted wares. The great abundance of the brown or terra cotta brick-colored ware is explained by the presence throughout the island of black loamy clays which are full of a natural tempering material, such as small bits of decomposed steatite, mica, chert or other stone pebbles, and grains of sand. Sometimes bits of broken rock or shell are added as an artificial temper. This terra cotta or brown ware varies but little in the dimension of the cross section of the walls, namely, 0.5 to 0.8 centimeter, the greatest cross-sectional dimension known in the examples recovered by the writer, 1½ centimeters, being in the basal section of shallow flat bowls and large urnlike containers from Andres on the Caribbean coast.

The earthenware forms from Santo Domingo are mostly for culinary purposes and for domestic use, ceremonial or ritual forms not being readily recognized except that such vessels bear no evidence of hard usage. Grave offerings so far as earthenware forms are concerned are of the regular food-dish and water-bottle type, and are not "killed." Distinct forms of the funerary urn, like the Jamaican oblong, thin-walled terra-cotta bowl, or the east coast Floridian grave figurine pottery, are not found. Several forms of vessels occur in practically the same frequency throughout the island, the most numerous perhaps being shallow food bowls with straight incurved or outcurved rims, with or without marginal figurine heads, convex walls with no clearly defined shoulder ridge or rudimentary foot, and the basal section flat or rounded.

Next in order perhaps are the circular, flat earthenware griddles which vary in frequency of diameter from 12 to 24 inches and in sectional thickness from one-half to nearly 2 inches. These objects are porous and are usually burned to a brick-red color. A few are burnished and slipped and are of firmer structure.

Oblong boat-shaped vessels with raised ends are frequently surmounted at the raised prow and stern with vertical figurine heads. This type of vessel appears as slipped or unslipped terra cotta. Deep globular vessels, usually brown or buff, have thick walls and

are essentially undecorated. These vessels may be bilaterally knobbed or not.

Three kinds of water bottles are characteristic of as many distinct subareas. One is a hemispherical, plain form occurring on the north coast; it has a constricted neck and bulbous oral region, and is frequently covered with a white slip; another, the heart-shaped thick-walled water bottle with bulbous neck section surmounted with bilateral animal or anthropomorphic figurine heads, is characteristic of eastern Santo Domingo; and, third, the large globose effigy canteen, which may reach a height of 1 or more feet, is the most developed of the three types. Several excellent examples from the northern provinces are housed in the Dominican National Museum. Globular effigy bowls with applied decorative animal and bird figurine heads at one edge of rim and a vertical or horizontal ribbon of clay attached oppositely, and with intervening wall space above the shoulder ridge covered with incised designs representing other parts of the animal body, such as wings or limbs, are unusual and are limited in their distribution to the southeastern provinces.

Flat round plates are less frequent than are the circular plates with slightly raised outcurved rim sectors which are decorated on the inner surface with banded incised geometric patterns. These earthenware plates are strikingly similar to our porcelain dinner plates in form, even to banded incised fretwork design encircling the border on the inner surface. Examples come from Monte Cristi and La Vega.

Globular bowls without applied anthropomorphic or zoomorphic features have geometric incised decorative design. They are usually small in size and belong to the terra cotta or brown ware. Oblong globular bowls when not embellished with figurines at either end occur in elliptic form resembling very much the boat-shaped vessels from Jamaica. They belong, however, to the terra-cotta ware, having thick porous walls. The Jamaican form of elliptical, boat-shaped vessel does not have the anthropomorphic or zoomorphic figurine head as a terminal decorative design but has proceeded further in conventionalization of form, appearing either plain or with one, two, or three knobs at raised prow, perhaps with a flat clay slab extending at the stern and an applied button of clay surmounted with crescent-shaped ribbon of clay in relief at either side. Apparently this knobbed design on boat-shaped vessels from Jamaica is merely a step removed from the boat-shaped anthropomorphic effigy vessels from Santo Domingo. The art has become more conventionalized, or decadent. The walls of the Jamaica ware, both in the boat-shaped and circular flat vessels, are much thinner than the Santo Domingan wares, and are either an unslipped brown resembling Cuban or a slipped buff or yellow ware. The thin-walled,

double gourd-shaped vessels from southeastern Santo Domingo, also the double-compartment spherical bowls from northeastern Santo Domingo, appearing either as plain-surfaced vessels or surmounted with recumbent animal figurines, belong to the highest type of Santo Domingan aboriginal pottery, and are limited in their distribution to the eastern provinces.

Details of construction and design.—At first glance there appears to be but little difference in the knobbed gray ware of the early Pueblo pottery and the knobbed conventionalized gray ware from Santo Domingo. It is only in the later developments of Pueblo pottery that striking contrasts appear. The resemblance of Santo Domingan earthenware forms to certain types and wares from the Eastern States, however, remains. The paste, as mentioned before, is principally of two kinds, producing the gray and the terra cotta wares, varying according to the presence of iron in the clay, the terra cotta producing a brown or chocolate colored, even a black ware, and the gray producing various forms of slipped and painted ware occurring only on the north coast and in the upland interior. Rims are usually small in height, frequently are reinforced with a ribbon of clay on the outer surface, and may be incurved or outcurved or straight. There is nearly always a sharply defined equatorial ridge or shoulder at the center of the body. Occasionally in eastern Santo Domingo this shoulder ridge gives way to a constriction forming a double-curved wall resembling a double gourd. Bottoms may be either flattish, rounded, or flat.

Rudimentary annular feet are rare and are flat or slightly concave. Forms having rounded bottoms are much more abundant, but these are always flattened spherical, never conical. So far as is known from collections, no Santo Domingan forms of earthenware vessels rest on tripod bases. Likewise no specimens have been recovered showing free supports or a deep annular foot as in certain earthenware types from the Lesser Antilles. Lids to globular vessels are rare, as are likewise grooved rims designed perhaps for reception of flat, knobbed lids. Incense burners are infrequent, the one discovered by De Booy in southeastern Santo Domingo being referred to by him as a filter jar. Walls are built up by coiling, as is the universal practice in aboriginal America. The applied decorative features, however, may be simple extensions of the wall coils, or, as in the knobbed designs, may be luted on as are the figurine heads and flat handle loops. Extensions of the coil are always horizontal; applied embellishments appear in a vertical position at or near the rim. In no West Indian earthenware vessel does the applied figurine occur anywhere but on or near the marginal rim. Handles or lugs show a wide range, varying from a simple flat or

circular loop, or projecting knob, to a highly decorative zoomorphic or anthropomorphic figurine head. Usually they occur only in pairs. In Santo Domingo the anthropomorphic figurine heads are conventionalized but the zoomorphic forms are much more realistic. Frequent references to these figurines as "grotesque" merely reveal the critic's lack of knowledge of local fauna. The molded figurines of the anthropomorphic type are also dissimilar to those from the archaic of Mexico and continental South America in certain features tending to classify them as less realistic. In other words, art in ceramics has become conventionalized in the development of new West Indian earthenware forms and should be characterized as postarchaic.

The effigy water jars which show the human figure usually with flat back, head thrown forward resting on the hands, elbows flexed to knee, legs flexed upward, are on the whole gracefully molded. In detail, however, a survival of the archaic is seen in the form of eye representation; headdress forms such as turbans and bandeaus; ear ornaments and pendants; and in the general position of the flexed arms and legs. Details of decorative design on the walls of vessels show a great departure from the archaic. Some of these details are as follows: Crudely executed cross hachure and scarification; incised lines in parallel occurring either in horizontal, vertical, or diagonal series and terminated by a shallow pit which is frequently separated, although it may be joined to the line. These terminal pits are also found on earthenware forms from Cuba, Porto Rico, and the Bahama Islands, but apparently do not occur in Jamaica or on pottery from the Lesser Antilles, or from Florida, where the use of punctations is sui generis. Straight lines and pits are incised or etched sometimes crudely or they may show the work of a skilled artist; rarely, however, do they indicate the use of a wooden paddle or earthenware pattern stamp such as is found in South America and in Florida. Applied ribbons and buttons of clay or figurines alternate with incised design. The use of circular or spiral incised lines is infrequent and is associated with the use of white paint. Incised or relieved semicircles emphasize the raised wen or knob representing an eye. An applied figurine head on otherwise plain surface is more characteristic of earthenware forms from the Lesser Antilles or from Jamaica. Spirals, crescents, and circles often form continuous decorative panels instead of the characteristic rectilinear fretwork of incised panels. So far as is known the use of design in intaglio is exceedingly rare, occurring only in association with slipped gray ware. Water bottles from Monte Cristi in slipped gray ware, otherwise undecorated, have geometric designs in intaglio. Vessels from Constanza and from Andres have depressed or inverted wens or nodes frequently alternating with

bulbous knobs, forming a design about the equatorial ridge, or near the lip presenting a new form, distinct from the ordinary incised or applied decorative designs.

DESCRIPTION OF TYPE EXAMPLES IN THE NATIONAL COLLECTION

Subareas of aboriginal pottery in Santo Domingo.—At each of the sites studied by the writer during the 1928, 1929, and 1930 seasons many variations in the decorative design, form, and style of earthenware vessels were observed. The range in decorative design and in form for each of the aboriginal provinces of Santo Domingo is much greater than had been anticipated. What at first glance appears to be a borrowing of a ready-made form or design from another pottery-making area is on more careful study found to be one of a series linking up with characteristic Tainan designs of the Santo Domingan-Porto Rican pottery area.

There are indications that the range of the Santo Domingan-Porto Rican aboriginal design area in earthenware extends well beyond the limits of those two islands and is linked on the south with lowland forest areas of South America and extends on the north to the margins of the eastern Indian pottery area, including pottery of the Iroquois of eastern Canada and contiguous United States. Again, other elements of aboriginal form and design as executed in prehistoric Santo Domingan pottery occur in representative collections from the upper Mississippi Valley, from the Gulf States of the Southeast, and from the Florida Peninsula. This observation does not imply that designs were consciously copied or that a diffusion of culture traits generally is responsible for the similarities in pottery. It is rather that tribes occupying a marginal position with regard to eastern centers of aboriginal pottery production combined certain elements of form and design in such a manner as to simulate a tribal culture diffusion, when even indirect contact can scarcely be proved.

There is no question but that we must consider the entire Mexican, middle American, highland and lowland South American pottery-producing areas as sharing a common heritage in their agricultural culture trait complexes centering about the culture of maize, cotton, cassava, and other root crops. With this common heritage of pottery production went certain details of technic and design. We must combine one other element in explaining pottery development in Santo Domingo, that is, the influence of local environmental differences, physical and spiritual. Attempts at decorative design through the more or less random incising of straight or curved lines on the walls of pottery vessels while still pliable are universal and human; the details of modeling and application of clay figurines on pottery

vessels are the common heritage of middle American tribes; but the lack of certain reptiles, mammals, and aviforms in Santo Domingo, and conversely the presence of genera of edible rodents, many species of owls and bats, belonging to a localized type of fauna—each of these three powerful factors serves to account for resemblances and differences in Santo Domingan earthenware forms and designs. The first two factors make for resemblances, while the latter accounts for differences such as accrue in the normal chronological development of traits in an isolated island culture. Then, too, the growth in Santo Domingo of a primitive religion centering about a number of potent zemis or local gods is apparently entirely distinct from Mayan, Muskhogean, and Andean culture areas.

Certain types and wares of aboriginal pottery from Andres on the southeast Caribbean coast of Santo Domingo are identical with those recovered by the writer in the Provinces of Monte Cristi and Samana on the Dominican north coast. There is also apparently a similarity of certain forms and decorative designs with vessels and shards from the mountainous interior of La Vega Province. A type of low-rimmed, shallow black-ware hemispherical bowl (not the type with incurved rim), undecorated as to surface and crude as to form, is apparently much more prevalent in the mountainous interior than on the Caribbean coast site at Andres, where the shallow food bowl (cazuela) has passed through a developmental stage and appears with an incurved rim covered with a banded incised decorative design. A rough correspondence does exist between bowls recovered at Andres and those from the interior, the Andres specimens being much thinner walled, and having a more conventionalized form with an incurved shallow rim, while the cazuela type of the interior provinces has thick walls, irregularly rounded contours, including a flattish, rounded bottom, and no incurved marginal rim or oral sector. (Pls. 6, 7.)

If the Constanza type of cazuela had been found along with non-Arawak skeletal material or culturally distinct objects, one might conclude that it had been fashioned by representatives of some non-Arawak tribe. The Constanza cazuela was found, however, in every instance with deformed skulls of the typical Arawak type in association with earthenware, including figurine heads of the well-known Arawak type. This low-walled, crude, undecorated cazuela is then to be considered an early undifferentiated Arawakan pottery form.

Variant from the known types of pottery from Santo Domingo is the thin-walled oblong or oval food bowl from the Arawak cemetery at Andres. This bowl has a clearly marked indentation or constriction surrounding the vessel midway between the margin and

bottom. (Pls. 52, 54.) This type of pottery, like most Arawak pottery from Santo Domingo, is unpainted, although it is burnished and fired to remarkably brilliant vermilion, chocolate, or olive drab colors. The outstanding characteristics of this type of vessel are hourglass shape, thinness of walls, and absence of incised figures and decoration with the exception of two crouching jaguar-like animal figurines in flat relief projecting horizontally from the top of the margin at opposite sides of the bowl. Here again we have no culture stratification indicated except that this form does not appear at the many other sites investigated in Santo Domingo where cruder pottery forms are more abundant. The conclusion is forced upon us, as Fewkes pointed out years ago, that southeastern Santo Domingan forms, along with those from southwestern Porto Rico, are superior and have reached a greater degree of development than have Arawakan forms elsewhere on the two islands.

Another variant less striking than those just described but nevertheless characteristic of a local development in southeastern Santo Domingo is a heavy-walled effigy vessel resting on a flat, annular bottom. (Pl. 54.) The incised decorative zone on the incurved upper half of the exterior walls is typically Arawakan. The projecting snout of an aviform figurine head is applied to one side of the vessel's rim and the flat clay slab representing the tail may be seen projecting on the opposite side. Horizontally incised lines terminated with pits in typically Arawakan fashion fill in the intervening spaces at the sides and may be considered as representing wings, the entire vessel then being a representation of some waterfowl or bird. Rudimentary effigy bowls occur elsewhere in the Greater and Lesser Antilles throughout the entire archipelago. Usually such vessels with figurine head at one side and tail placed opposite are oval and may be roughly described as boat shaped, being hollowed out at the center and having a raised prow and stern. Typical examples of this form have been recovered by the writer in Samana and by Theodoor de Booy at Salcedo in eastern Seibo. The shape is characteristic of pottery forms from Jamaica. (Pl. 41.) Small trencher or boat shaped vessels with a high prow and stern, obtained by the writer at Andres, invariably have a distinct figurine head at either end and could in no case be considered effigy vessels. They rather illustrate the simple introduction of a figurine head at the high terminal ends of the vessel as in Iroquoian ware.

Another form of earthenware is a heart-shaped water bottle recovered from Andres. (Pl. 10.) Several such water bottles were excavated almost identical in form but varying in size. A short, rather bulbous neck, superimposed on a heart-shaped body with flat bottom and with no decoration except an incised panel at the sides

are the characteristic features of this vessel. The bulbous neck area of Santo Domingan water bottles generally has been noted elsewhere [23] and along with other examples recovered by the writer in Monte Cristi and in Samana form a series unique in West Indian pottery forms. These water bottles invariably have animal figurine heads projecting from the bulbous neck either near the constricted margin or lower down close to the body of the vessel. (Pls. 11, 14, 17.) A typical modeled figurine to be applied is that of the frog. Sometimes frog figurines appear individually, in which case the molding is realistic indeed. Sometimes the frog figurine is enlarged, occupying the entire neck region, being pierced at the center to obtain a lip or oral margin. (Pls. 7, 11.) The best example of this type is now in the Dominican National Museum.

Variants in decorative design, in form, and in paste are clearly the work of the individual aboriginal potter, when the specimen does not represent a tribal borrowing, or a chronological sequence within the subarea where it appears.

Two characteristic types illustrating the wide range of Santo Domingan pottery forms are, first, the 2-compartment bowl with one compartment superimposed over the other, but separated from the other by a strongly marked constriction at the center (pl. 52); second, a rectangular oral sector on a globular vessel with a series of rim depressions at the center and end (pl. 52). Each of these types, the first with its equatorial constriction, the second with its wavy margin and rectangular rim form, might well be taken from some collection of Iroquois or other northeastern Indian pottery. The bottom of the globular vessels may either be small but flat, or somewhat rounded like the Algonquian conical type. The 2-compartment vessel with equatorial constriction is distinct from the gourdlike constricted vessels from Peru and from the Pueblo area in that in Santo Domingo (Andres) the upper compartment is usually larger than the lower, while in the gourdlike type the upper compartment is much smaller, resembling the gourd in a very realistic manner. Each of these vessels described has the combined decorative elements of incised lines terminated with a punctation, alternating with applied animal and human figurine heads projecting from the walls of the vessel just below the margin.

Another form with oblong, rectangular outline, while dispensing with incised lines and figurine head embellishments, introduces instead a series of wens alternating with deep pits at either end of the vessel, resembling Jamaican forms. A similar type of pottery embellishment occurs on boat-shaped funerary vessels recovered

[23] Krieger, H. W., (a) Archeological and Historical Investigations in Samana, Dominican Republic, Bull. 147, U. S. Nat. Mus.; (b) The Aborigines of the Ancient Island of Hispaniola, Ann. Rep. Smithsonian Inst. for 1929, pp. 473–506, 1930.

from graves near Kingston, Jamaica. (Pls. 41, 42.) In the Jamaican forms three buttons or knobs are placed in series at the raised ends of the oblong vessel. In the similar example from Andres the series of raised knobs at the end of the vessel includes but two, which, as mentioned before, are separated by a corresponding indentation which forms a knob projecting inward rather than outward.

Another design from Jamaica is a crescent-shaped ribbon of clay surrounding a central knob. This form of Jamaican earthenware has exceedingly thin walls and like the Andres example has no characteristic archaic figurine heads. It would be rather interesting to speculate as to chronological sequences when we have this outstanding difference in decorative design: First, archaic figurine heads of unmistakable antiquity; second, a simple design of knobs and buttons alternating with depressions appearing on characteristically thin-walled vessels usually of red ware but widely distributed and known from sites in Jamaica, Andres, and Samana in the Dominican Republic, and from Manati in Porto Rico. Doctor Fewkes was the first to describe this type of pottery, which he discovered in the Cueva de las Golondrinas near Manati in Porto Rico and which he describes as a red ware having "two solid knobs on the rim. * * *" The writer uncovered many objects of a similar red ware at San Juan on the northern coast of the Dominican Republic in Samana Province, each having vertically applied ribbons of clay or projecting knobs and buttons similar to the Andres, Kingston, and Manati red ware.

For the present this knobbed or otherwise undecorated pottery must be considered as distinct from the usual Tainan decorated ware, as to form, color, and decorative embellishment. Some of the knobbed pottery forms from Andres are unusual or depart from the usual type of knobbed red ware in that the walls are extremely heavy and generally present a cruder appearance.

Perhaps the crudest and earliest type of all is the extremely irregular, flat-bottomed, globular vessel with pronounced upright margin somewhat constricted, but with a well-marked shoulder surrounding the vessel. (Pl. 46.) Typical decorative designs on such vessels include a paneled decoration on the incurved outer wall above the shoulder and series of concentric, crescent-shaped lines, perhaps a marginal incised band and a crudely molded lug or handle, stuck on at opposite sides of the shoulder and representing some animal form known to the Tainan artist or pottery maker. The concentric crescent-shaped etched panels are occasionally replaced with a cross hachure or with V-shaped lines meeting one another at various angles, the latter forming a decorative panel crudely encircling the upper half of the outer walls of the vessel. Always, however, we

find the decorative handle or lug representing some animal form. Perhaps at the other end of the series we might expect to find such highly developed examples as the 2-compartment, thin-walled, knobbed red ware (pl. 47), or the painted and slipped thin-walled oval or boat-shaped type, neither of which could have been fashioned by the Arawakan potter in the early stages of his development.

If we were to compare the pottery of the Santo Domingan Arawaks with that of the Caribs of the Lesser Antilles, the former might be designated as unpainted and the latter as painted ware. This broad distinction, however, does not adequately characterize the two groups, as at the center of intensive pottery production in the Greater Antilles, that is, in southern and western Porto Rico, also in southeastern Santo Domingo, painted ware makes its appearance. Then again on the north coast of Santo Domingo in Samana and in Monte Cristi white and red painted ware are not infrequent. Also it is frequently impossible to distinguish between the incised decorative designs on pottery forms from Santo Domingo or Porto Rico and from the Lesser Antilles. Closer inspection, however, usually reveals definite distinctions in the incised ware from these two areas; the Caribbean pottery from the Lesser Antilles having isolated, deeply incised lines, while the incised designs from Santo Domingo scarcely ever appear as single rectilinear or curvilinear lines, but appear as encircling bands or decorative panels of parallel lines, somewhat resembling in this respect the trailed incised bands from certain Choctaw sites in Mississippi. Distinctions in form between the wares of the Greater and Lesser Antilles might readily be pointed out, such as basal forms from the Lesser Antilles consisting of free standing legs, annular rings or flat-bottomed pedestal bases, as contrasted with rounded or flat bottoms, and the rarely appearing low annular bases characterizing Santo Domingan wares. A distinction frequently made regards applied or secondary decorative design, namely, that figurine heads from the Greater Antilles are supposedly mostly anthropomorphic while those from the Lesser Antilles are more of the so-called bloated head type, with additional designs, such as turtle figurines, inclined to the zoomorphic. This distinction is of little significance, as aviform and other zoomorphic types of molded figurine heads are common to Monte Cristi, Samana, La Vega, Puerto Plata, and southeastern Santo Domingo. The distinction also has been made that stamped design on pottery was characteristic of the Lesser Antilles but not of the Greater Antilles. Dominican and Porto Rican pottery collections include examples of earthenware cylinder and flat disk stamps, not all of which, however, were used in applying pottery designs, although some of them were undoubtedly so used. Spindle whorls are common to both areas. The more rounded so-

called bloated appearance of zoomorphic figurine heads characteristic of the Lesser Antilles occur infrequently in Santo Domingo. Mortuary pottery from the Virgin Islands as discussed by Theodoor de Booy is for the most part of shallow plain ware, while mortuary pottery from Santo Domingo as typified in the numerous finds from Andres is quite varied and richly ornamented, many of the pots and vases, however, showing little evidence of former use, but not forming a variety of mortuary pottery distinct from the domestic ware. The plain mortuary ware of the Virgin Islands is undoubtedly Caribbean.

Incised line design terminated with one or several punctations or shallow pits is undoubtedly limited to the Bahamas and the Greater Antilles, exclusive of Jamaica, but does not occur in the Lesser Antilles, and but infrequently in the States bordering the Gulf coast.

Both the Lesser and the Greater Antilles apparently repeat in stone many of the details of decorative design appearing on earthenware vessels. This applies to the secondary modeled or relief features, and to the incised designs as broken lines, whether rectilinear or curvilinear, transverse lines at right angles, forming T-shaped figures, parallel lines, punctations in series. All of these incised figures are characteristic of Santo Domingan wares. It might be noted in passing that many of the figurine heads appearing as decorative embellishments on pottery from the Lesser Antilles appear to have angular outlines, are more massive in design (bloated), and appear foreign to the more conventionalized heads from Santo Domingo. In the West Indies the heart-shaped water bottle, also the effigy water jar, apparently is limited to the Porto Rican and Santo Domingan area. This is true also of the large effigy jars which resemble very much certain forms of water jars from Arkansas. Intrusive Caribbean designs from the Lesser Antilles characterized by two or multiple compartment bowls in red ware, and the use of paint rather than of incised decorative paneling, is limited in the Greater Antilles to southwestern Porto Rico and northern and eastern Santo Domingo. Incised lines filled with kaolin or other white mineral pigment and polychrome painted ware comes mainly from the island of St. Kitts. Here also we find red and white painted vessels, but kaolin-slipped gray ware as well as water bottles with decorative designs in secondary modeling in intaglio apparently are restricted in their distribution to the Santo Domingan north coast in the Province of Monte Cristi. Large effigy figurines of the human body are rare in Santo Domingo, although a few are known. These are usually excellent examples of modeling in free-hand and represent individual figures seated or crouching with flexed legs in realistic pattern. Representation of certain of

the inner organs and parts of the body, as vertebral column, ribs, and other parts, appear molded in relief. (Pl. 8.)

In form, both Lesser and Greater Antillean areas show a wide range from the flat earthenware griddle to the elaborate vase. What has been said regarding earthenware forms and designs from Porto Rico and Santo Domingo does not apply to ceramics from Cuba and Jamaica, where Arawak forms have originated distinct as to paste, form, and design.

Earthenware objects made by the aborigines of Santo Domingo are for the most part vases, shallow hemispherical dishes, plates, globular bowls, effigy jars, and bottles. Many of these vessels are irregularly circular, others are oval, trencher, hourglass, or gourd shape with angular rim. The rim is often decorated with relief figures.

As a rule the pottery is a granular, unpainted, but well-made biscuit or terra-cotta ware. Many of the specimens have flat, others have rounded bases. The decoration is ordinarily incised by lines or relief figures. Among the common forms of incised geometrical designs are lines, triangles, spirals, and circles. Spirals are rare, but parallel and angular lines are very common. The potter terminated a line with a shallow pit that was joined or slightly separated from the end of the line. There is no other pottery area known to the writer where this decorative technic is employed except from the tribes (Ashanti) of the Nigerian coast of Africa. The continuity of circular lines is also broken by inserting at the break either a double pit or a short line drawn at right angles.

Handle lugs are in general similar throughout the island of Santo Domingo, and may be classified as zoomorphic figurine types or as loop handles. In the latter group a raised ring of clay served all the purposes of a handle, but there were often added marginal grooves with adjacent elevations. The loop handle is sometimes broad and flat, at other times narrow and round. A conventionalized figurine type of lug has two or three knobs on the rim. Perforations may occur just below the knobs. The edges of the handles of many vessels are pinched into ridges that may be corrugated, notched, or serrated.

Modeled clay heads have much in common, eye, ear, nose, and mouth appearing in conventionalized design, together with characteristic fillets over the forehead, scrolled, fluted, and circular coronets, and are also characterized by deeply incised lines. The general cast of many of the specimens suggests monkey heads, but this resemblance is unintentional, and it is possible to identify a great majority of these figurines as representations of local fauna.

In decorative design a tendency toward a conventionalized treatment of realistic models of animal and bird heads, also of human

facial features, indicates presumably a long period of isolated development of forms and shaping technic. Symbolism also has an important place in the designs incised on stone, bone, and wood sculptures, also in painted designs. In their decorative designs, the incised figures are well suited to the space they are intended to occupy. Characteristic is the ornamentation of a space in which the central pit is surrounded by circular incised lines or a raised band, which in turn is surrounded by a series of broken circles, the corners between these broken circles being filled in with triangular or other angular linear incisions. Whatever archaic forms exist in native Tainan earthenware—that is, open pottery vessels with clay figurine heads mounted at the ends and facing inward, likewise the punctated decorative designs, and several of the peculiar arrangements of features—luted ribbons of clay to represent eyes, mouth, and other facial features—all these features in pottery decorative design may not have come to the Greater Antilles by way of the Venezuelan and northeastern South American coast, but might far more reasonably have been introduced by a less circuitous route from Central American culture areas direct.

In comparing the earthenware of Santo Domingo with that of any locality in Middle, North, or South America many elements of form and decorative design are encountered which are entirely dissimilar. Along with these local excrescences of intensive pottery manufacture are many elements of form and design unmistakably closely related to Antillean pottery types and wares. Elements not introduced by the aboriginal potter of Santo Domingo are tripod bases, vessels with free standing supports, cylindrical or annular bases, feet with rattles, pottery whistles, polychrome painted decorative designs, incised figures in realistic life patterns, or pottery decorations consisting of multiple affixed spherical knobs. Such elements are foreign to the Porto Rican-Santo Domingan pottery complex, while incised and punctated decorative designs and applied animal figurine heads from widely separated regions resemble those of a particularly archaic type from sites in Santo Domingo. Roller stamp designs in curvilinear and rectilinear patterns are common alike to areas in Central America, Panama, and North America, but are unusual in Santo Domingo. No conventionalized or realistic designs representing fruit or vegetable forms as in the highland areas of South America or in the central Mississippi Valley are in evidence in prehistoric wares.

The relieved and incised decorative embellishments on unpainted earthenware fragments from ancient village sites at Titumate, on the Colombian coast, mentioned by S. Linné (fig. 7, p. 27) are identical with the technic of plastic design of the Santo Domingan

potter.[24] This applies particularly to the details in the modeled clay figurine heads, also in the sharply incised, somewhat jagged lines representing eyes, mouth, etc. Resemblances are likewise seen in the potsherds with decoration consisting of clay rolls attached to the walls of the vessel and patterned with pits or jagged punctations from Trigana, on the Colombian coast. Linné's finds at Titumate, Colombia, resemble the plastic decorative designs from Santo Domingo. Potsherds from Trigana, a Cuna Indian site between Acandi and La Gloria, Colombia, resemble those from Santo Domingo in the encircling bands of pits.

The unpainted pottery from Pearl Island off the Pacific coast of Panama has, like Punta Patino on the Pacific coast, decorative embellishments consisting of incised lines, punctations, free, in zones, and in parallel, identical with punctate designs on black and brown wares from Monte Cristi. This method of applying pits or dots is unlike the Tainan incised line with terminal pit closely associated, or but slightly removed. On the Dominican north coast flat loop clay handles are frequently supplanted with rounded coils of clay placed in transverse or horizontal position in irregular curves. This feature, although an elementary one, becomes significant when associated with other similar features.

While much of the pottery from Santo Domingo comes in globose or hemispherical bowls and vases with flattened or rounded base, vessels with flat or even with projecting annular base are not rare. The well-defined straight walls of the base never exceed one-half inch in depth.

Branch reports annular feet to pottery vessels from St. Kitts, while Hatt makes similar comment regarding St. John (Virgin Islands) ware. The annular foot is quite common to the Colombian and Peruvian central highland areas, and to Mexican, also to the Arkansas-Tennessee area in the middle Mississippi Valley. De Jong reports similar finds from Aruba, and Fewkes from Trinidad. Tripod vessels are, however, foreign to the Greater Antilles and proximal North and South American areas, except in Florida.

Lothrop [25] says that fewer than fifty vessels, complete or restored, are known to him from aboriginal Porto Rico, and that not a dozen of these have been illustrated in published reports. Since the earthenware of that island belongs to the same regional classification as do Santo Domingan aboriginal wares, Lothrop's classification is given here.

Porto Rican pottery may be divided into three principal wares distinguished by the clay, finish, and, to a lesser extent, by the decorative motives, while

[24] Linné, S., Darien in the Past. Goteborg, 1929.

[25] Lothrop, S. K., Two Specimens from Porto Rico. Indian Notes, Mus. Amer. Indian, Heye Foundation, p. 324, October, 1927.

each ware has definite distribution and affinities. The largest group is a brown ware made of a coarse and porous clay with a large admixture of tempering material such as sand or shell. This ware has a general distribution throughout the island. A red-ware group is apparently made from the same clays as the brown ware, but has been covered with a red slip or has been dyed a brick red; characteristically, it is found on the south coast and at the western end of the island. Along the south coast, between Ponce and Mayaguez, certain shell heaps yield a buff ware with a smooth creamy slip. Finally, on the southern part of the western coast one finds a two or three color painted ware, which is best considered a subvariety of the brown ware. The major divisions of Porto Rican ceramics are then:

1. Brown ware: Found in all parts of the island.
2. Red ware: Found chiefly in the west and south.
3. Buff ware: Found chiefly in the south.

The three wares we have listed are separated one from another primarily by color and texture. On the same basis a further division may be made, because regional or even local styles are detectable within each ware. For instance, the brown ware of the south coast tends to be thick and coarse; the western brown ware is harder and thinner, and often it is marked by small crevices as if partially tempered with an inflammable material, such as bark; and the north coast and mountain brown ware is intermediate in thickness and often has an uneven surface.

The three major wares of Porto Rico are further distinguished one from another by their decorative motives. In general decoration is achieved by modeling and incising, rarely by painted designs of simple character. Most Porto Rican vessels are effigy bowls or jars, to which animal or human character is given by a head, arms, legs, or wings in relief, while further details may be accentuated by incised lines. * * * At times also pots are decorated with incised designs of geometric appearance placed in encircling bands. As is the case with most New World pottery motives, these patterns on careful analysis usually disclose a zoomorphic origin.

The bowl under discussion evidently is an effigy of a bird, perhaps a pelican, for a long projecting birdlike tail is its most obvious characteristic; on either side are incised areas indicating the wings, while opposite the tail is a small head marked by a long bill, an eye, and a crest. Flanking the head are a pair of arms or legs, which suggest that this particular bird either was conventionalized to the point where the legs have been displaced from their natural position or else that we have some monstrous mythological type such as the Moan bird of the Maya.

The bird motive seen on this bowl is not unique, for it appears frequently on pottery from the west coast shellheaps and occasionally on south coast vessels; but it usually occurs not on brown ware, as in this instance, but on red ware. * * * Of the primitive Ciboney culture discovered by the (Heye) Museum in Cuba there is little trace in Porto Rico. Buff ware from the south coast shows extremely close affiliation with ceramic remains from Haiti, Jamaica, and Cuba. * * * Red ware, while in part exhibiting distinctive local decorative motives, on the whole shows affinity with the Lesser Antilles. We therefore judge that most red ware is of Carib workmanship or at least reflects Carib influence. Brown ware includes the pottery with the strongest local flavor and is the most widespread type. Stratigraphical examination of a shellheap (Punta Ostiones) by the writer in 1916 showed that brown ware fragments appeared in greatest numbers in the oldest refuse. Hence we believe that brown ware was at first made only by Tainans, but, as shown by the incorporation of Carib motives, it may have been manufactured by

the Caribs or by their captured Tainan wives. The combination of red-ware decoration and brown-ware clay (effigy bird bowl) is best explained by this hypothesis.

It should be added that effigy "brown ware" (terra cotta or biscuit ware) bowls occur also in eastern Santo Domingo.

Samana pottery types.—Earthenware forms and decorative designs on pottery from eastern Santo Domingo have been described by Dr. J. W. Fewkes,[26] Sir Robert Schomburgk, Theodoor de Booy, Sven Loven,[27] Joyce, Hatt, Rivart, Krieger,[28] and others. The first intensive study of pottery forms from eastern Santo Domingo was that by Theodoor de Booy,[29] who explored cave middens and excavated cultural deposits within the boundaries of the aboriginal Province of Higuey, in southeastern Santo Domingo.

Pottery objects from three distinct local areas in Samana were collected by the United States National Museum expedition and forwarded in part to the United States National Museum and in part to the National Museum of the Dominican Republic at Santo Domingo City. The sites explored are the caves on the south shore of Samana Bay; the village site at Anadel, on the southern slope of Samana Peninsula; and the large village site at San Juan, on the northern coast of the peninsula, each of which yielded potsherds of somewhat different description. The San Juan site yielded the greater variety of pottery fragments and complete vessels in form, paste, technic, and decorative design.

Pottery from the Samana caves.—Forms represented in the cave finds are largely conjectural, as only a few shards of sufficient size were recovered to clearly establish the type. Then, too, most of the ware recovered from the caves is undecorated. The more common relief embellishment on the few decorated shards is a sharply defined thickened rim section, formed either by luting on of an additional reinforcing ribbon of clay around the outer margin of the rim, or through the use of a thicker rim coil.

Shards of globular shallow bowls were recovered at Cueva del Templo ("Railroad" cave), while fragments of incised line and of punctate decorative patterns were picked up at the site of the rock-ledge burials on Upper Orange Key and in the kitchen middens in "Simmons" cave. Ordinarily the cave pottery from Samana is plain, well-fired terra-cotta ware, for the most part unpainted, but

[26] The Aborigines of Porto Rico and Neighboring Islands, Twenty-fifth Ann. Rept. Bur. Amer. Ethn. (1903–04), pp. 1–220, 1907. A Prehistoric Island Culture Area of America, Thirty-fourth Ann. Rept. Bur. Amer. Ethn. (1912–13), pp. 35–281, 1922.

[27] Ueber die Wurzeln der Tainischen Kultur, Goeteborg, 1924.

[28] Archeological and Historical Investigations in Samaná, Dominican Republic, Bull. 147, U. S. Nat. Mus., 1929.

[29] Pottery from Certain Caves in Eastern Santo Domingo, West Indies, Contr. Heye Mus., no. 9, 1915. Also, Santo Domingo Kitchen Midden and Burial Mound. Indian Notes and Monogr., Mus. Amer. Indian, Heye Foundation, vol. 1, no. 2, pp. 103–137, 1919.

revealing patches of a firmly incrusted red or lavender hued slip. Many of the shards are thin-walled, but occasionally an unusually thick fragment appears. A few plain-necked water-canteen fragments were recovered from Boca del Infierno, while a few shallow globose bowl fragments similar to the shallow Tainan ware from the peninsula were uncovered from the midden in the "Railroad" cave.

One well-fired globular brick-colored bowl was dug up from Upper Orange Key (U.S.N.M. No. 341056). Quality of the paste and firing is superior to the more granular shards recovered from ordinary Taino sites. The bowl is 5.5 inches (14 cm.) in diameter and 4.7 inches (12 cm.) high. The ¾-cm. thick walls have a coating of ashes and lime. A similar incrustation adhered to the inner and outer walls of pottery objects recovered from the two Orange Keys. Incrustations due to the dripping of lime-impregnated water from the cave ceiling of Boca del Infierno cave also adhered to the shards recovered from the cultural deposits there. Shards from the vicinity of the hearth on the cave floor are thickly coated with carbon, bespeaking their former use as cooking vessels. The small number of canteen fragments from the caves is remarkable in view of the fact that drinking water had to be carried to the caves from a distance of one-half to 2 kilometers.

Food bowls from the burial cleft of Upper Orange Key, with few exceptions, were broken beyond recognition of their original form. It is probable that some of the pottery fragments found with the burials were used as funerary urns in which the skull and long bones were placed.

Characteristic of the form of pottery from the caves are such details as handles or lugs of flat ribbons of clay and raised rims. These lugs are not luted on to the vessels after the fashion of the usual Tainan ware but form an extension of and are incorporated in the coil block of the vessel.

Shallow bowls and food dishes from the caves and from sites on the peninsula are not always globular or hemispherical. Rectangular vessels have raised rim sections alternating with depressed sections. The elevated portions are at the ends if the vessel is oblong, and bilateral elevations and depressions appear if the vessel is rectangular. A peculiar reinforcement of the walls of certain forms of earthenware vessels is noted in the parallel series of raised ridges extending from the rim coil vertically to the shoulder. These upright ribbons of clay are utilized as surface decorative embellishments and always terminate at the highest point in vessels with raised rim sections. Vertical reinforcement ridges are illustrated in No. 2, Plate 47.

A fragment of a large deep bowl was recovered from the hearth at "Railroad" cave. The fragment was incrusted with soot and charcoal, which when removed revealed a bright brick-red color. This and other fragments show the use of a slip.

The large bowl, U.S.N.M. No. 341055, figured in No. 4, Plate 47, was recovered from under a mass of bowlders in Cueva del Templo, or "Railroad" cave, where it had originally been placed either to collect the water dripping from the roof of the cave or for safe keeping. The bowl is globular in form, plain as to decorative designs, except for a panel of incised lines on the incurved shoulder just beneath the vertical neck section. The rim is plain and vertical. The body of the bowl is that of a flattened sphere and has a flat bottom which curves slightly upward at the center.

The decorative panel on the incurved shoulder is characteristically Tainan and is made up of alternate horizontal and vertical incised lines in series of five or more in parallel. Both horizontal and vertical lines are terminated by a shallow pit. At the level of the decorative panel and luted on bilaterally as handle lugs are clay zoomorphic figurines of the so-called "monkey" type. The upper and lower portions of this type of clay figurine stand out in high relief, while the central area is markedly depressed. The simplicity of the technic employed in shaping the figurine is remarkable because of its effectiveness. Four parallel horizontal incised lines of two different lengths are introduced on the surface of the figurine, the shorter at top and bottom, with the longer lines traversing the central area of the figurine head. These lines are terminated with punctations or shallow pits in typically Tainan style.

In color the vessel is a light buff with an overlay of carbon from repeated firing. The bottom of the vessel has become weakened from weathering or by penetration of oils and fats. About one-third of the inner sectional diameter of the walls of the vessel remains unfired. The paste is there revealed as a black, porous earth, heavily impregnated with particles of crushed steatite and stone pebbles, constituting a tempering material. The earth from which the vessel was built up is apparently that of the Samana Peninsula and is not from the vicinity of the caves on the south shore.

San Juan pottery types.—Three small bowls characteristic of the pottery from the San Juan site are also illustrated in Plate 47. The boat-shaped vessel resembles in form boat-shaped earthenware types from Jamaica and Porto Rico, but it is more nearly identical with a food bowl recovered by De Booy from the caves at Salada, in southeastern Santo Domingo. Broken sections of the walls reveal an unfired area of black earth at the center of the walls. The bowl (U.S.N.M. No. 341019) is oblong, like a boat, with a high prow

and stern, and is a reddish brown in color. The elevated rim section at either end is terminated with a clay figurine in conventional design peering outward. Features of the figurine are indicated by means of shallow pits without the introduction of connecting lines. A border of incised parallel lines beginning at a terminal pit is continued as a concentrically recurved series of four parallel lines. The bowl below the shoulder angle is plain. A small flat bottom covers a diameter of but 1.8 inches (4.5 cm.), while the length of the bowl at the shoulder is 5.5 inches (14 cm.). The width is 5.3 inches (13.5 cm.); it is 1.8 inches (4.5 cm.) higher at the ends than at its center, where it reaches the height of 3 inches (7.5 cm.). Food bowls 2 and 3 of Plate 47 are heretofore undescribed, although some of the pottery handles excavated by Doctor Fewkes and figured in the Twenty-fifth Annual Report of the Bureau of American Ethnology are similar to the parallel luted ridges shown in the 2-compartment food vessels as shown on the plate. From the descriptions of Doctor Fewkes and from the pottery fragments illustrated in Plate 73 of the Twenty-fifth Annual Report of the Bureau of American Ethnology, much of the ware, especially the plain handles and handle lugs from San Juan, resemble and in many cases are identical with those from the Cueva de Las Golondrinas of Porto Rico. Hundreds of shards, consisting of raised pottery surfaces constituting handle lugs and representing animal heads, with mouth and eyes incorporated, are shaped from body coils, constituting an extension of the body of the bowl itself, and are not luted onto the vessel, as are the characteristically Tainan figurine heads. This is a Carib rather than a Tainan form of decorative design.

Doctor Fewkes described this type of raised handle, excavated likewise in the Cueva de Las Golondrinas, near Manati, as follows:

> The handles are in general similar and evidently belonged to coarse bowls, vases, and ollas. In similar forms a raised ring of clay served all the purposes of a handle, but there were often added grooves with adjacent elevations. The handle was sometimes broad and flat, at other times narrow and round. One of the specimens * * * has two solid knobs on the rim; another is perforated just below similar knobs. The edges of the handles of many vessels are pinched into ridges that may be corrugated, notched, or serrated.
>
> Hardly any two handles are exactly alike; * * * These show that there was an abundance of red ware. The surface of this pottery in one or two instances is smoothly polished.[30]

A similar type of pottery embellishment occurs on boat-shaped funerary yellow ware vessels from caves near Kingston, Jamaica. In the Jamaican forms three buttons or knobs are placed in series of three at the raised ends of the oblong vessels. Another design is

[30] Fewkes, J. Walter, The Aborigines of Porto Rico and Neighboring Islands, Twenty-fifth Ann. Rept. Bur. Amer. Ethn. (1903–04), pp. 1–220, 1907.

in the form a crescent-shaped ribbon of clay surrounding a central knob. This Jamaican earthenware, like that from San Juan, has exceedingly thin walls. No characteristically Tainan figurine heads occur.

Pottery types from the cave deposits were fewer than from the San Juan site, which yielded an abundance of material from which selections were made for the Museum collection. The striking similarity of certain types of San Juan pottery to the ware figured by Doctor Fewkes from the Cueva de Las Golondrinas in Porto Rico sets this type of pottery as distinct from the usual Tainan decorated ware, as to form, color, and decorative embellishment. In addition to the Golondrinas type of pottery, there were recovered at San Juan food bowls resembling the Salado ware described by De Booy from near Cape Macao, eastern Santo Domingo. This type of pottery is typically Tainan, but is specifically characterized by curvilinear incised lines terminating in shallow pits. To this type belongs the boat-shaped food bowl. (Pl. 47.)

Zoomorphic and anthopomorphic clay figurine heads, together with fragments of shallow food bowls, were recovered at San Juan in quantity. Examples of these figurine heads are illustrated in Plates 14, 23, 24, 27, and 28.

Characteristic of the Golondrinas type of red ware but also characteristic of many similar fragments from San Juan is the double-compartment food bowl (pl. 47, No. 2, U.S.N.M. No. 341021). The bowl is painted red with a dull-brown slip on its inner surface. Unfired areas within the walls are revealed by broken fragments and show the paste as the usual type of black earth impregnated with a profuse tempering of minute fragments of steatite pebbles and of white sand. The bowl is 6.6 inches (16.8 centimeters) long, 2.6 inches (6.6 centimeters) high, and 5.2 inches (13.3 centimeters) wide at the center of each compartment. As to paste and tempering materials, the red ware from San Juan is similar to the usual Tainan earthenware from the same area. In form, however, and in the application of a red slip or paint and in the firing the type is foreign to the more common Samana earthenware. The walls of this red ware are much thinner, the firing has progressed to a more thorough stage, and the introduction of a central diaphragm separating the vessel into two oval compartments, together with the luting on of vertical bands of clay bilaterally near the rim of either compartment—all these characteristics are foreign to the usual type. The walls of the vessel are thicker at the center near the sectional diaphragm dividing the vessel into two compartments. The vertically applied ribbons of clay which appear near the upper surface of the bowl in pairs are possibly decorative lugs. The lugs may appear as modelings of animal heads in

a style distinct from the archaic figurine heads well known as Tainan. In this type of plastic sculpturing in clay as mentioned, the modeling of life designs is incorporative; that is, the figures are not applied but are an essential part of the vessel, as in the ancient pottery of the Cauca River Valley of Colombia.

A unique form of thin-walled red-ware vessel from San Juan appears in No. 3, Plate 47 (U.S.N.M. No. 341020). The vessel is almost a perfect sphere and is symmetrical. The walls are unusually thin and plain, but are unique in that they terminate abruptly with the incurved shoulder and have no neck area or marginal reinforcement. The bottom of the vessel is flat. Dimensions: Diameter, 4.7 inches (12 centimeters); height, 3.4 inches (8.5 centimeters). Orifice at the top is 1.6 inches (4 centimeters) in diameter. Paste and tempering are similar to the usual type of earthenware from the peninsula.

Pottery stamps and miscellaneous objects.—Flat, circular earthenware objects from prehistoric habitation sites in eastern Santo Domingo have been described as stamps. It has been conjectured that they may be cassava graters. One of the group, U.S.N.M. No. 341023, is obviously neither, but is a spindle whorl of simplest form. It is fragmentary, but sufficient material remains to identify it as such. No design is incised on its surface, as on the pottery stamps. Its diameter restored is 3.2 inches (8 centimeters); thickness, 0.5 inch (1.3 centimeters). The hole at the center is 0.5 inch (1.3 centimeters) in diameter. The material used is similar to the paste employed in the majority of objects recovered from San Juan, where this whorl was excavated. Tempering material is also similar and consists of many granular particles of sand and gravel and bits of crystal quartz. (No. 6, pl. 35.)

Stamps figured in Plate 35 are problematical. The designs vary, some being rectilinear, incised figures converging at a common center; others are partly curvilinear and extend across the surface transversely; another has small punctations divided into panels with a grooving stick; and one introduces deep pits more or less evenly spaced. It is possible that these various pottery forms represent objects used in games. The average diameter is 2.7 inches (7 centimeters); thickness, 0.6–0.8 inch (1.5–2 centimeters). Some of the figures are incised on either lateral flat surface; others are plain on the reverse. When designs are applied to both flat surfaces they differ from each other in each instance. This would scarcely be necessary with a simple utilitarian implement. If used as a stamp to place designs on pottery vessels before firing the impressions made by it would be in relief. Only a few fragments of decorated ware recovered showed such raised designs. (Pl. 37.)

In Santo Domingo pottery, stamps are of three types, an oval or circular flat disk, a cylindrical form, and a flat disk with handle attached. The flat circular disk stamps are the most common, while the tubular or cylindrical stamps are rare. The flat circular disks with attached handles are of somewhat infrequent occurrence. Only flat circular disk stamps are known from Samana and Monte Cristi. In southeastern Santo Domingo there apparently had been a greater development in the use of pottery stamps, if we are to judge from the variety of forms, both the tubular or cylindrical earthenware stamp and the handled disk stamp being limited to that section. De Booy found this latter variety in his researches in the Province of Higuey in southeastern Santo Domingo, and the writer found a similar example at Andres on the Caribbean coast. (Pl. 36.) Doctor Abbott obtained two cylindrical stamps from the lower valley of the Yaque del Norte (pl. 34), while Fewkes obtained and describes a similar object, province unknown, from the Archbishop Meriño collection.

Examples: Pottery stamp—2.1 inches (5.4 centimeters) long; diameter 2 inches (5 centimeters). Circular flat stamp with handle, excavated from midden at Andres. Handle perforated near top. Deeply cut angular designs. (Pl. 36.)

Flat disk pottery stamp, fragmentary, 2.4 inches (6 centimeters) in diameter. Etched designs on one side only in the form of spokes converging at a common center; from midden at Andres. (Pl. 35.)

Fragmentary pottery stamp, apparently oval, portion of remaining fragment 3.4 inches (8.5 centimeters) in diameter. Circular flat-bottomed impressions covering the one decorated surface; from Andres midden. (Pl. 36.)

A variation from the ordinary type of earthenware stamp is the earthenware pestle with disklike base, showing a design such as might have been used for impressing designs in tattooing or on pottery. This form in other respects does not depart from the general type of earthenware pestle of southeastern Santo Domingo. The pestle under description is 4 inches (10.2 centimeters) in length, 2.2 inches (5.7 centimeters) diameter of disk base. The head is molded into the shape of an animal figurine head. The paste is porous, containing large particles of stone and bits of wood and shell as tempering material. (Pl. 55.) Constanza Valley, from midden at Cerro de Monte.

Cylindrical roller stamps of earthenware and flat earthenware pattern stamps have a wide distribution throughout the pottery area of Central and South America. These stamps served a varied purpose for stamping conventional designs on cloth, on the human body, and to a lesser extent on earthenware. The rarity of these in archeo-

logical collections from the Antilles is all the more noteworthy inasmuch as both weaving of cotton cloth and body painting were commonly practiced traits. Flat pattern stamps of clay are figured and described by De Booy, Fewkes, and Krieger from eastern Santo Domingo, and by Harrington from Santiago, Cuba. Similar stamps are described by De Jong from Aruba, an island off the Venezuelan coast, while Fewkes mentions similar examples from Trinidad, Carriacou, and the Lesser Antilles. Roth also describes discoidal clay stamps from the Grenadines. Gilij describes an earthenware stamp from the Orinoco Valley, while Marcano mentions their use by the Piaroa Indians of the Venezuelan uplands.

In the United States, ceramics showing impressions made with a flat stamp are described by Holmes from Florida and from the eastern Gulf coast, from Georgia by Thomas and Moore, from Tennessee by Holmes and Harrington. We have no evidence that pottery vessels from these subareas have decorated impressions fashioned with flat earthenware clay stamps, wooden stamps apparently having been used exclusively. Archeological finds of flat pottery stamps are frequent in Mexico and Central America, where ceramic impressions of flat discs have been reported by Gregory Mason from British Honduras and stamps from Loltun in Yucatan have been described by Thompson. From sites in the valley of the Cauca in Colombia and sites described by Uhle in Peru similar finds are described.

The cylindrical stamp has a much more limited archeological distribution in Santo Domingo, Mexico, Central America, Colombia, Venezuela, and Ecuador. Fewkes describes one cylindrical earthenware roller stamp from the Meriño Santo Domingan collection, and the writer has described another collected by Abbott from northern Santo Domingo. (Pl. 34.) A similar roller stamp in the Rijks Ethnographisch Museum, Leiden, from Aruba off the Venezuelan coast, is described by De Jong, but no similar archeological find comes from any other Antillean site than from Santo Domingo. No cylindrical earthenware stamps are known from the Toltec Teotihuacan horizon in the valley of Mexico, but both types are known from the later Aztec culture level. In Santo Domingo, as in Mexico and northern South America, cylindrical stamps are less frequent than are the flat pattern stamps. Earthenware stamps, whether flat or cylindrical, were infrequently used in stamping designs on pottery, their primary importance perhaps being in weaving or for body ornamentation.

Molds for pottery manufacture have a limited distribution in Mexico and in the Andean region and are not found in northern South America, the West Indies, or in southeastern United States.

The patterns for decorative designs common to earthenware stamps from Santo Domingo, the Lesser Antilles, and northern South America are quite similar to those from Central America. They are almost identical with earthenware stamps recovered from the Floridian and Gulf coasts. Designs carved from wood or bamboo usually differ entirely from those produced with an earthenware stamp, whether flat or cylindrical. The idea of a mechanical stamping device is coextensive with the area of intensive pottery production.

In the Southeastern States stamped earthenware vessels are known from Florida, North and South Carolina, Georgia, Tennessee, and Alabama. Also from Iowa, Wisconsin, Illinois, Indiana, Ohio, and Michigan. Check-stamp pottery, also the promiscuously stamped ware from Florida and the Gulf coast, has an exceedingly limited distribution. Stamped earthenware of more varied designs has a much wider range. There is much more resemblance in the incised wares of the southeast and of Santo Domingo than there is in stamped designs on earthenware from any of the States enumerated. Aside from the archeological finds of stamped earthenware from British Honduras described by Gregory Mason, much of the earthenware showing stamped designs comes from the eastern United States rather than from the Antilles, Mexico, or Central or South America. Among modern Indian tribes, the story is a different one, many South American tribes being known as stamping their earthenware, however, not with earthenware stamps. In the United States the modern Cherokee wares are typical of the stamp-impressed decorative embellishments.

A cylindrical pattern stamp showing a meandered fret with interstices of concentric triangles, ends set off with encircling bands of two incised lines leaving a central relieved ridge; also a circular flat pattern stamp consisting of a central pit surrounded by crescentic recurved lines forming quadrants with a transverse line at each of the four quadrants, are from the Archbishop Meriño collection, also another cylindrical stamp collected by Dr. W. L. Abbott near Guayabin and figured by the writer (pl. 34) shows curvilinear incised designs more crudely executed. Cylindrical stamps from Santo Domingo are rare, no other examples being known from the Greater Antilles.

In Plate 25 are illustrated a series of pottery fragments incorporating decorative designs consisting of series of pits. One of these fragments (U.S.N.M. No. 341039) shows parallel rows of shallow pits evenly spaced. These pits were made with a blunt end of a stick, but were applied with such force as to make a corresponding raised dot on the reverse or inner surface of the potsherd. All the fragments have a surface color of dull brick brown, but have been blackened by use on one or both surfaces. One has pitted decorative

designs appearing on the inner surface of the fragment; others have the design on the outer surface. No. 4 of Plate 25 is unique in that the pits are excavated from a ridge or shoulder appearing on the surface of the shard near the bottom of the vessel. This archaic type appears on forms of South American pottery, especially from Venezuela and Colombia.

Crosshatching and stone collar decorative designs.—A form of decorated ware from the West Indies hitherto undescribed occurs in two shards from a shallow food bowl illustrated in Plate 25, Nos. 6 and 7, U.S.N.M. No. 341039. The decorative design on the incurving surface above the shoulder of the bowl appears to have been made with crosshatching from a rather broad spatula for the vertical and a narrower spatula for the lighter or horizontal designs. Portions of an earthenware griddle (pl. 53) appear to have been molded on a basketry base. If this is so the embellishment constitutes an unusual type.

An interesting coincidence in design appears in the stone collar representations illustrated in Plate 27 as 1 and 2. Doctor Fewkes, in the Twenty-fifth Annual Report of the Bureau of American Ethnology, at considerable length demonstrates how designs sculptured on stone collars are similar to pottery figurines appearing as "grotesque" anthropomorphic or zoomorphic designs on handle lugs. A new element in the expression of aboriginal Ciguayan (Samana) art designs appears where the decorative design in pottery fragments incorporates the outline figure of a stone collar. No. 1 shows a simple outline of a stone collar without decorative embellishments; 2 introduces the peculiar knotted section as it appears on stone collars. Mason describes this part of the collar as the shoulder ridge. The double-shoulder ridge, as it is represented on the pottery fragment 2, recalls the older form and might serve to illustrate the knotted withe where the two ends of the hypothetical wooden collar were joined. Thus the same design which first produced a knotted ridge where the two ends of the wooden collar were joined later reproduced the same relief pattern in collars of stone, and finally the entire figure of the collar reappears as a decorative embellishment on an earthenware handle lug. (U.S.N.M. No. 341026.)

Rattles.—Characteristic of Tainan potter's art is the occasional shaping of a hollow cylindrical lug and the placing within it of a small pebble. Cylindrical rattle lugs are not common or of frequent occurrence in the Samana area, although two were recovered at the San Juan site. One of these (U.S.N.M. No. 341038) is a simple globular-shape lug luted onto the side of a pottery vessel. A narrow clay band pilastering marks the place where the hollow cylinder lug had been closed after insertion of the pebble. Another hollow

rattle lug (U.S.N.M. No. 341038) is shaped in the form of a bird's head. This figure is illustrated as 5 on Plate 25. Bill or beak and eyes are not shown in the illustration. Feathers are represented as raised ridges and by concentric curvilinear parallel grooves. On the centrally placed ridge appear a number of shallow punctations intended to represent the crest of some species of wattled bird.

Rattles of earthenware in the form of bird figures resembling the famous bird figure whistles from Chiriqui were found by Linné on the Atlantic coast of Darien. These figurines were, however, not separate but showed lines of fracture where they had been broken off from some earthenware vessel. They resemble applied earthenware animal figurines from the Lower Amazon. Rattles inserted in the hollow foot or annular ring of earthenware vessels found by Linné in Darien on the Atlantic coast are also found in Mexico, Central America, and Bolivia, but do not occur in Santo Domingo, where, however, rattles either in the form of bird heads or other figurines applied as knobbed handle lugs do occur, principally on the northern coast.

Clay figurine heads.—It has been customary to refer to the Tainan clay figurine heads as "grotesque." It is apparent that such a term is misleading, in that the "grotesqueness" is due not to intentional deformation or distortion of heads modeled from clay but in part to the technic of the primitive plastic artist following conventional lines of sculpturing and modeling of animal life coming under his observation. The rules are so simple as to make a realistic portrayal impossible. Use of incised lines and pits surrounded with ridges are the simple means employed to achieve artistic results. Some examples are characterized by a rough modeling of the head with frontal, orbital, nasal, and chin eminences well marked. Even such details as ear appendages are modeled out of the solid, but as a rule the eyes, eyelids, nostrils, lips, teeth, headdress, convolutions of the ear, the ear lobe, and mouth are represented by simple applied and incised buttons of clay, modeled with a central depression and an outer raised rim. The lobe is pierced transversely for insertion of a discoidal ear ornament.

Two types of eye modeling may be noted in addition to simple punctate forms. The eyes are formed with a raised ribbon of clay in roughly circular position. The ridge is flat-surfaced or beveled, and is surrounded with an incised circular depression; within is a circular depression or pit, rarely a slit. Again, the eye is represented with a distinctly bulging expression, due to the beveled surface of the modeled circular ribbon of clay representing the orbit. The pit is also smaller, and the outer or surrounding incised groove is lacking. An unusual realistic type of a modeled pitted eyeball was recovered from a Constanza midden.

Nose modelings in anthropomorphic figurines range from a simple bulbous excrescence to the straight and rather prominent type of nose, where the nostril pits are excavated in a more realistic manner than is usually seen in Tainan clay figurines. A unique form of nose modeling has a triangular excavation underneath the nasal eminence. The entire figure assumes an owlish cast because of the series of concentric ridges and grooves. The mouth and lips are represented by two parallel transverse or horizontal ridges divided by a sharply defined incised depression. Teeth are represented by a set of five vertical ridges alternating with a corresponding number of depressions, the whole surrounded with an incised groove.

A unique representation of a manatee appears with one flipper emerging from underneath the head of the figure. Nothing more is presented. This omission of nonessentials is a method of artistry typical of several groups of aboriginal Indians. The tribes of the Pacific Northwest coast practice the same technic in their wood carving when representing their totemic animal crests.

Generally it is impossible to recognize the species of zoomorphic figurines modeled in clay by the aboriginal potters of Santo Domingo. It is occasionally possible, however, to identify a figurine as the representation of one of the various groups of life forms, as mammal, bird, fish, sea or land mammal, or as anthropomorphic; more definite identifications are almost always untrustworthy because of the conventionalized technic of the artist. Undoubtedly some of the figurine heads are intended to represent zemis or personal totems belonging to an individual, family, or clan. Some of the figurine heads which resemble animal forms are conventionalized presentations of the human head, and, conversely, the realism of design bespeaks an old and deeply rooted culture, not necessarily a high culture, but one thriving throughout a long period in isolation. Realism in decorative design, then, often assumes no particular significance, but is simply presented and without ceremonial importance. Our lack of appreciation of mammalian forms as they exist in Santo Domingo often leads us to pronounce as a grotesque modeling that which actually is a faithful realistic representation.

Modeling of life forms.—The aboriginal Santo Domingan art of modeling in clay various life forms, such as the human head and animal forms, is rarely freed from culinary or cult pottery forms. Medallion-like reliefs of the human face occur more in the Lesser Antilles than in the islands of Porto Rico and Santo Domingo. Decorations are effected by modeling and incising, rarely by painted signs. Incised designs of geometric appearance placed in encircling bands do not disclose a zoomorphic origin as in Florida and other of the southeastern United States, except for the lateral incised

panels indicating the body or limbs of life forms, the head of which appears in high relief. Effigy bowls or jars to which animal or human characters are given by a head, arms, legs, or wings in relief by means of clay coils are infrequent.

The molding of entire human figures was almost impossible to the Arawak artist. He had developed no conventional technic for doing this, showing thus a lack of contact with what has come to be known as the archaic. Of course, it is possible that the potters' arts, filtering from the more highly developed peoples in Colombia and Central America to the less developed Arawak and other tribes of the South American lowlands, never had carried with it the details of conventional design of the human body. At any rate when such molded figurines do occur in the West Indies they are unique, being entirely dissimilar to those from the archaic horizon. A fragmentary earthenware figurine, 4.2 inches (10.6 centimeters) long, and cross sectional diameter 2.2 inches (5.6 centimeters), has arms consisting of raised ribbons of clay extending down the back and across the sides. Legs are not represented. This is the same technic as is found in the zemi figures carved from stone. This is a clue perhaps to the use to which this figurine was put, that is, in religious ceremonies as a zemi or idol. The fragmentary head still shows the method of eye molding resembling the split coffee bean. Nose and mouth in relief are less conventional and more realistic. (Pl. 36.) Valley of Constanza.

Earthenware figurine: 4.1 inches (10.4 centimeters) long; cross section 2.4 inches (6.2 centimeters). Body fragmentary, but the etched representation of an animal figurine head appears at one end. This bit of primitive modeled sculpture very much resembles petroglyphs found in the Guacara cave near Cotui and in St. Vincent, British West Indies. Impossible to determine type of animal represented. Technic used to obtain the impression desired is by line etchings, concentric circles, with terminal punctation and two central excavations or pits representing eyes. From the valley of Constanza. (Pl. 36.)

Fragmentary portions of human figurines with details representing arms and legs are of sporadic occurrence. One of these fragments representing the left foot and a portion of the leg is 1.9 inches (4.8 centimeters) long, 0.8 inch (2.3 centimeters) wide. Nothing of any merit in the technic revealed. Crudely molded. No arch on the foot. Toes are represented by transverse incisions. Another more ambitious modeling of what appears to be the right foot and lower leg of a human figurine is 3.1 inches (8 centimeters) in length. The foot is flat, toes indicated by transverse incisions showing no realism in form; the thickened knee joint, however, betraying an appreciation of form. A peculiar spur resembling the toe on the

leg of a horse appears halfway between foot and knee, perhaps representing the ankle. The fragment is covered with a reddish slip. (Pl. 36.) Representations in modeled clay of the human arm and hand are far more common. They are always molded in a conventional style showing development of form. Some of these representations conform to the shape of the vessel to which the figurine is attached, and the flanking arm or hand is merely incidental. Others, far less numerous, are modeled free and appear to have been at one time a part of some figurine used perhaps as a zemi. Representations of the foot or hand have only four digits, and slightly removed is a wen or knob representing perhaps the wrist joint or ankle.

In the Museum of the Dominican Republic in Santo Domingo City are three large earthenware effigy water containers in which the entire vessel has been molded to conform to some part of the intended figurine. (Pl. 8.) These effigy water containers are quite large, one of them being more than 2 feet in height. They are shaped to represent crouching figures; their use, other than that as containers for liquids, is problematical. One of these containers is almost identical with an earthenware effigy figured by W. E. Roth in Plate 26 of the Thirty-eighth Annual Report of the Bureau of American Ethnology. This human effigy vessel, along with several other earthenware effigy figures now in the Georgetown Museum, British Guiana, reveals a close connection between early Arawak pottery in Santo Domingo and that of the early tribes of Guiana.

The representation of a seated figure, one side flat and the other side rounded, was collected by Fraser at Puerto Plata. The front view shows a portion of the head and the body, legs, and arms, the arms being flexed upon the breast. Representations of the ribs and of several of the vertebral processes are shown in the side view. The umbilicus and male sexual organs are visible. The thigh, indicated by a ring, is double at one point or broken, as is common in incised decorations of this character. The toes appear below the rump; the upper leg and knee are well modeled. (Pl. 5.)

Fewkes describes an effigy vase from a cave near the Aguas Buenas, not far from Caguas, Porto Rico, representing an animal recumbent on its back, head and tail protruding from opposite ends, the inverted body of the animal serving as the body of the vessel. Many nodes consisting of nucleated circles mark the terminations of legs, and joints, as the knees and elbows, are placed, through lack of space, in angular positions. Features of the face are also indicated in the main through the raised nucleated circle. Incised V-shaped figures fill in the intervening spaces at the sides.

An effigy form is figured by Pinart, who ascribes the ownership to Padre Bellini, of Santo Domingo. Of reddish-brown clay, 7½

inches (19 centimeters) high and 4.7 inches (12 centimeters) across the base, it is said to have been found in a cave at the Rancho Viejo, between the towns of Bani and Azua. The illustration shows a crouching attitude, the arms crossed at the knees, the head covered with a cap or turban, and the ears having prominent ornaments. Pinart regards this specimen as the sole known object of its kind from the island of Santo Domingo. The image is seated on a stool of which two legs are shown. From the shoulders extends a projection slightly flaring at the top. Its present owner is unknown. Another clay image of the same type is described by Fewkes and owned by Señor Deangles, a Dominican. It represents a seated figure, elbows resting on its knees, and is of a reddish burnt clay and smooth surfaced. The head is surmounted by a turban rounded above the face. Body is curved forward, narrowing to the waist, the vertebrae and ribs being represented in relief. Bands encircle the arms above the elbows. The lower legs are swollen and show slight turbercles on the outer side of the ankles. No canopylike extension appears above the back of the neck as in Pinart's specimen. The facial features of this figurine are more realistic than are the conventionalized figurine features generally. It is probable that a portrait figurine is here represented in plastic sculpturing.

Water bottles.—Especially large is the number of water bottles from the island of Santo Domingo. Except, however, the fragment described by Mason from the Guesde collection of Guadeloupe and another fragment figured by Fewkes from Porto Rico, no other island of the Antilles produced water bottles similar to those from Santo Domingo. The Guadeloupe specimen apparently is identical with Santo Domingan examples. Central America appears to be out of consideration as the huastekan teapot type with long oblique neck sector is foreign to the West Indies and the Santo Domingan form complex, resembling more the Pueblo water canteens from the Rio Grande.

The Santo Domingan water bottle appears to include several types but is essentially similar to those from Cauca Valley of Colombia.

Canteens or water bottles of earthenware are known from Arkansas and the middle Mississippi area, also from southeastern Mississippi and Louisiana, and from the mounds at Moundville, Ala. This latter site is especially noteworthy, as other ceramic resemblances with the Antilles might be shown. Bottles, however, not with narrow necks were recovered by Moore in the vicinity of the Gulf coast of northern Florida. Florida is closer to the Antilles than Moundville, but offers few resemblances to Antillean ceramics. Water bottles from the Florida coast bear no resemblance to those from Santo Domingo, but belong to a series of cylindrical vessels

with straight or slightly incurved necks merging into canteen or bottle forms.

All of the elements characteristic of Santo Domingan water bottles reappear in the water bottles from the Andes, even to the modeled face on the neck. The Santo Domingan bottle frequently is characterized by the peculiar heart shape, often expanded into two mammae; also by a modeled figurine head applied to the lower neck area. The bottle has a ringlike thickening of the upper neck. Such a vessel is not known from North America.

A water bottle from the Archbishop Meriño collection has two lateral extensions, each resembling a human breast with a nipple. Its neck is bottle shaped and bears on one of its sides a face with eyes, nose, and prominent ears in low relief. The base is circular and flat. Incised grooves encircle the top of the breast-shaped lateral extensions surrounding the nipple. Other crescentic lines, broken by two short vertical transversely incised lines each terminated by pits, encircle the breast-shaped extensions immediately below the nipple band. The surface of this vessel is rough, indicating a former polish. This vessel is an elaborate form of the heart-shaped water bottles occurring throughout eastern Santo Domingo.

Mr. Gabb collected in Santo Domingo a fragmentary earthenware bowl, (pl. 40) of spherical form, with incurved walls above a well-marked equatorial ridge, and surmounted with straight high rim. The sides of the vessel are decorated with bilaterally placed figurine heads in low relief on the body of the vessel just below the neck. Each head is flanked with figures representing raised hands, palms turned outward. Above the forehead are several ridges, marking a horizontal tubular-shaped figure, a common form of Santo Domingan head turban or headdress, or perhaps merely a conventionalized decorative element. Except for the rather large applied head forms, the walls of the vessel are free from decorative embellishments.

Another heart-shaped water bottle, globular in form, is from the Archbishop Meriño collection. Incised bosses mark the heart-shaped enlargements of the flask. The lower neck region is molded into the shape of a large head with ears represented in the characteristic figure 8 form by means of two circular rings. Eyes are represented by nucleated circles, each perforated.

Bottle or flask shape forms are represented by examples in the Imbert collection from Puerto Plata. A face in relief appears on one side of the neck. The nose, much enlarged, appears as a series of folds, separated by depressions, filling the space between the eyes. The body of the flask had a pronounced angular form and the characteristic flat circular base. A similar globular water flask

has eyes and mouth in relief, the ears being represented at either side. The mouth of this water bottle is nipple shaped, a rare form, although others have been found at Andres on the south coast.

Earthenware water bottles with regularly formed necks occur in the Greater Antilles only in Santo Domingo, and except for two or three fragmentary examples have not been recovered from any other of the islands of the West Indian Archipelago. Similar water bottles of earthenware are found in several culture areas of North and South America, but not in middle America. The huastekan type of water canteen with its long oblique neck section is dissimilar to the Samana types, of which apparently there are two. The simpler of these neck forms, of which a large number were found at San Juan, has a plain, short, cylindrical, constricted neck. The other more artistic and highly specialized type has a long neck with a knobbed or bulbous rim. An anthropomorphic or zoomorphic face is molded as a decorative embellishment of the lower neck; the upper portion of the neck area has a circular ringlike enlargement. This type of water bottle reappears in Panama and in the Andean region of South America. A third characteristic, that of arched mammæ on the body of the water vase or bottle, appears alike in Ciguayan and Panaman water bottles.

A human effigy vase (Tule Indians of the San Blas coast, Panama) for storing chicha is made of black ware, heavily stained with chicha and uniformly blackened from smoke. The general form of the vase is spherical, with a constricted, tubular neck orifice elongated to one-third the total height of the vessel. A combination of coiling with modeling by the potter's hand, aided with a calabash shell and a knife, was the method employed in its production. The human facial features stand out in low relief, filleted on the surface of the neck piece, as are also the arm representations on the walls of the body of the vessel, an ornamentation technique reminiscent of ancient Chibcha ware from Colombia.[31]

The descriptions of an effigy canteen from Panama is similar to that of U.S.N.M. No. 341038 (No. 3, pl. 15), from San Juan. This type of canteen differs from the other Ciguayan forms in that the features representing the anthropomorphic design appear on the spherical body of the vessel rather than on the constricted neck section. The eye appears as a circular raised coil or ribbon of clay with a central shallow pit; the nose is straight and prominent, forming a clear-cut wedge; the mouth area is an oval strip of clay, across the center of which is a deep incision. The ear likewise appears as a raised and slightly curved strip of clay luted vertically on the sloping shoulder of the vessel.

Similar canteens, but without the narrow necks of the Santo Domingan water bottles, have been found on the Gulf coast of

[31] Krieger, H. W., Material Culture of the People of Southeastern Panama, based on specimens in the United States National Museum, Bull. 134, U. S. Nat. Mus., 1926.

northwest Florida. Water bottles also have been recovered from the mounds of middle Mississippi Valley, from Louisiana, and from Moundville, Ala. Other similarities of Moundville pottery with that from the Greater Antilles might be pointed out.

Ringed rims and decorated neck sections of pottery water bottles were found at Anadel, San Juan, and in the cave deposits. Many of these are simple cylinders with an enlarged or reinforced rounded rim. A thick-walled type of water container, shaped from a gray-colored, granular paste differing from the black loamy clay paste from which most of the vessels and potsherds of Samana had been fashioned, is represented also by numerous shards from the Andres midden.

The bottles figured in Plate 14 reveal a surface finish in two colors, a creamy white and a salmon color. In 1 the contrast between the two colors used is marked. A white slip, perhaps of kaolin, had been applied. This has in part disappeared, giving the peculiarly spotted appearance noted. An animal figurine head had been applied at the side and stands in high relief. The figurine is the characteristic "monkey" type, in which features are represented by transverse lines, the eye by incised circle and dot, while the nose is realistically done and shows wide nostrils. Other decorative attempts consist of raised ridges traversed by wide incised lines. The outline of the bottle appears to have included two or more globular expanding and contracted areas beginning with a globular or bulbous enlargement of the lower neck area.

In its outline the form of 2 is distinct and more Tainan. It was recovered from the San Juan site. Concentric curvilinear lines at the top are terminated with shallow pits, and are filled in with concentric triangularly incised lines. A raised disk-shaped surface at the side of the head of the bottle quite near the rim may have served as a rest when the vessel was tilted. It is impossible to explain the raised disk as an element of decorative embellishment. The rim orifice is narrow, 0.8 inch (2 centimeters) in diameter. Tapered walls of the neck area are plain, except for the luted figurine head apparently wearing a headdress and having pierced ear lobes.

The neck and head of water bottle 3, Plate 14, U.S.N.M. No. 341037, has a raised rim, well rounded and tapered from the orifice to the neck area. The globular expansion of the walls of the lower neck is studded with raised surfaces and details of the decorative figure. The walls again become constricted before merging with the walls of the body of the vessel.

In the bottle under description there is a raised disk appearing on the rim section in the form of a nucleated circle. This becomes the head of a figurine, the legs of which appear at the sides of the neck. Another raised disk on the lower neck walls becomes the

umbilicus of the figurine. The interior of the neck of the vessel shows how elaborately fitted together are the several luted-on parts of the decorative embellishments. The vessel is an excellent example of Antillean potter's art but diverges from the primitive Ciguayan type of water bottle, which was plain and of unpainted red terra-cotta ware.

The more common form of Santo Domingan earthenware canteen and water bottle is undecorated except at the neck, which is usually bulbous below and constricted just below the marginal rim.

There are two types of earthenware water bottles with effigies either of animal or human forms luted onto the neck or incorporated as a part of the walls of the body. One of these, usually of gray ware, is quite large, sometimes standing 3 feet in height. It is oval or rounded in outline, tending in some examples to become heart shaped. The figurine head appearing on the neck of the bottle or container usually is applied at two opposite sides of the neck, the space between being filled in with incised line etchings forming panels. Three exceptionally good examples of this type of effigy water bottle are now in the Dominican National Museum. (Pls. 9, 11.) Another is in the private collection of Señor Andres Socias, of Copey, Monte Cristi. A smaller type of so-called heart-shaped water bottle (pl. 10), characteristic of southeastern Santo Domingo, is more common and has been preserved because of the strength of its walls and its diminutive size. Where the large water bottle had been placed as a grave offering in the cemetery at Andres the pressure of the sand was such as to break in the walls. The smaller heart-shaped bottle is frequently recovered intact. Doctor Fewkes, in the Twenty-fifth Annual Report of the Bureau of American Ethnology, figures an excellent specimen. The writer recovered three similar heart-shaped water bottles with decorated neck sector from the Arawak cemetery at Andres, the smaller of which had a height of 4.4 inches (10.9 centimeters) and a maximum transverse section of 3.4 inches (8.7 centimeters), the larger, a height of 8 inches (20.5 centimeters) and a maximum transverse section of 6.4 inches (16.2 centimeters). (Pl. 10.) These water bottles are heavily walled, flat bottomed, depressed oval in section, thus giving the typical heart-shaped outline. The neck is bulbous, incorporating bilaterally placed animal figurine heads representing the frog in conventional design. No decorative design appears on the body of the bottle except occasional etched lines, circles, and dots, with angular spurs filling in the triangular spaces.

Many heads and necks of earthenware water bottles were collected from the mountainous interior of La Vega Province; that is, in the Valley of Constanza. The bodies of these vessels have been

broken and lost. The Constanza type appears to be the same kind of water bottle as from eastern Santo Domingo, that is, undecorated except for the bilaterally placed figurine heads appearing on bulbous neck sector. Some of these heads are quite elaborate in the conventional art displayed, particularly those of the so-called "monkey-face" type, that is, a figurine with projecting snout region and depressed middle part of the head. One example of an effigy canteen where the head of the canteen is also the head of the animal figurine and the bulbous neck area has been molded to represent the body is of characteristic monkey-face type with projecting snout region. (Pl. 55.)

Conventionalized art has proceeded to such length in West Indian ceramics that, as stated, it is frequently impossible to determine whether a bird form or an animal form is intended. Diagonal curved lines appearing at the sides might well be interpreted as representing ribs or wing feathers. Raised ribbons of clay at the back might similarly be interpreted as representing either vertebrae of some mammal, such as the monkey, or a color pattern in feathers. All of the decorated water bottle necks are unmistakably Arawakan in that wherever it is conventionally possible the primitive artist has introduced etched lines with terminal punctations alternating with raised knobs of clay.

Paints and slips are fairly common on water bottles. This was first noted in a series recovered from kitchen middens at San Juan on the northern coast of Samana Peninsula in 1928. Along with the application of different colored slips and paints it was noted in 1929 at Monte Cristi, during excavations at a site in the Silla de Caballo Mountains, that gray ware was preferred in the making of water bottles. A white slip of kaolin was frequently applied. Clay for making these superior vessels of gray ware must be obtained at a greater depth than that of the ordinary clay which forms the terra cotta or biscuit ware. A characteristic Antillean decoration found rarely on water bottles in Santo Domingo is the realistic figure of a frog occupying the entire neck and head of the bottle. (Pls. 7, 11, 55.) Of all the animal forms attempted by the Arawak artist the frog figure is the most successful, at any rate it is the most realistic. There is never any mistake as to the intent.

Vases and censers.—A lobate vase with bottle-shaped neck and flat base, U.S.N.M. No. 316445 (pl. 43), from the Cueva de Roma, collected by Dr. W. L. Abbott, is 8¾ inches high, has unusually thick walls of a consistency approaching stoneware, but has typical Tainan decorative designs of concentrically incised circles and central pit inscribing a panel just above the shoulder ridge and below the constricted neck. Bilaterally placed conventionalized figurine heads in

relief are incorporated in this decorative panel. Another vessel, U.S.N.M. No. 293016, from the valley of the Rio Yaque del Norte, has extremely thin walls and but narrow opening at the convergence of the convexly rounded incurved walls. Incised lines encircle the vessel at the shoulder and just below the lip, where is formed a flat neck panel perforated bilaterally. Crescent-shaped incised lines pass from neck panel to shoulder, forming semiovate figures. Traces of red paint remain. (Pl. 45.)

In describing Indian pottery from caves in eastern Santo Domingo, Theodoor de Booy mentions[32] a typical earthenware water bottle fragment, of which, however, the neck cavity and head is intact. The constricted upper neck region and flaring lip are characteristic, as is also the enlarged lower neck with its incised decorative panel and figurine head (aviform) at the side. A peculiarity is seen in an earthen diaphragm separating the bulbous neck cavity from the globular body of the vessel. The diaphragm is perforated with ten or more holes made with an implement inserted from above, leaving a ragged edge at the bottom. This so-called filter arrangement is unique, although similar perforations are frequently found on the slablike or broad loop handles of shallow bowls from north coast sites. De Booy's "filter jar" was found by him in a cave at Salado near Cape Macao on the eastern coast. Another noteworthy find of De Booy's from the Salado caves is a water bottle in which the effigy figurine occupies the entire wall surface of the bulbous neck cavity. The figurine is anthropomorphic. Eyes are rounded buttons bisected with transverse slits and surrounded by deeply incised grooves. A ridge in high relief passes between the eye moldings to form the nose. Flaring nostrils are modeled in rather exaggerated style. The mouth is represented by a heavy and deep transverse groove. An incised line passes around the mouth area, emphasizing the lips. The general grinning and bloated appearance of the effigy is reminiscent of Lesser Antillean effigy forms rather than of typical Santo Domingan types. Other figurine heads and vessels described by De Booy are of typical Tainan form and design.

A vessel now in the British Museum from the coast of Peru has two superimposed compartments, the upper being provided with a perforated bottom. Cobo states that the Indians of Peru roasted maize in perforated bowls. A modification of this usage is the steam cooker of the Chane, the Chiriguano, and the Mataco Vejos. Vessels with perforated bottoms occur in the Pueblo area of the Southwest, also in Mexico in the Huastec area. Tribes of the Lower

[32] De Booy, Theodoor, Pottery from Certain Caves in Eastern Santo Domingo, Contr. Heye Museum, No. 9, reprinted from Amer. Anthrop., n. s., vol. 17, No. 1, 1915.

Amazon have earthenware vessels with perforated bottom. Moore figures two vessels from Louisiana, each provided with free-standing hollow feet which are connected with the body of the vessel by means of "several small holes drilled through the vessel at each of the points of union with the legs to enable the latter to serve as receptacles for liquid, in conjunction with the body of the bottle."

Stove censers used by the Tule of the San Blas coast of Darien shaped from a dark-brown tenacious clay partly by modeling and partly by coiling have annular feet. Extending upward from the outer circular edge of the foot are several lateral supports separated from each other by seven orifices. This septuple stove base is covered over with a slab which also serves as the bottom piece for the compartment above. Piercing the bottom of the compartment just outside the place of juncture of the seven lateral base supports and placed equidistant are nine draft holes with an average diameter of 1 centimeter. According to Tule informants these perforations are used as draft holes in connection with the burning of the cacao bean incense or when the upper compartment is used as a brazier. In short the perforate bottom device appears to be coextensive with the pottery area on the Western Hemisphere.

Pottery pestles.—Dr. J. W. Fewkes classifies the stone pestles of the Greater Antilles, according to their component parts, as grinding surface, termed "the lens"; the handle; the ferrule; and the head. The stone pestles from Samana have no decorative figurine head, and in other respects resemble the stone pestles of the Caribs of the Lesser Antilles. Two other kinds of pestles were found by the Museum expedition in Samana; one of shell, U.S.N.M. No. 341004, the other of earthenware, U.S.N.M. No. 341022. Only the lens and a section of the handle of the latter were recovered. The lens is developed somewhat in the form of a door knob, while the handle shaft is narrow. It is broken off 2.2 inches (5.5 centimeters) above the base. The diameter of the lens at the base is 2.4 inches (6 centimeters). The base is smooth and shows no evidence of use as a triturating or grinding pestle. The paste of which the pestle fragment is shaped has been tempered with bits of shell, stone, and sand. The handle shaft does not project from the exact center of the lens and so betrays a crudity in free-hand molding. Most pestles from Santo Domingo have a well-developed lens, whether the media be stone, shell, or earthenware. The aborigines of Samana probably used the earthenware pestle as a cassava, food, or pigment grinder. Although fashioned of nondurable material, the earthenware pestles are much larger than the pestles of carved shell. Several earthenware pestles were collected from Constanza middens in 1930.

Tubular object of earthenware with discoidal base, such as might have been used as a stamp: Same type as pestle just described, Constanza. Dimensions: 2.7 inches (7.2 centimeters) long, 1.8 inches (4.6 centimeters) diameter of base. The shaft tapers to a head which has been incised with a modeled human figurine. (Pl. 55.)

Earthenware pestle: 2.6 inches (6.5 centimeters) long, 2.1 inches (5.2 centimeters) diameter of base. This specimen, like all earthenware pestles from Santo Domingo, has a sharply defined shaft. Head has been incised to form a 2-faced figurine head, eyes and mouth being indicated by punctations and etched lines. (Pl. 55.) Valley of Constanza.

Earthenware pestle: 2.6 inches (6.1 centimeters) long, base 1.6 inches (4 centimeters) in diameter. The figurine head which apparently had been modeled separately and later luted onto the shaft has been marred during excavation. Valley of Constanza.

Earthenware pestle: 3 inches (7.2 centimeters) long, diameter of shaft, 1.5 inches (3.5 centimeters). This pestle differs from those just described in that the entire object has been molded to represent an animal figurine, the base representing the legs, the arms projecting at the sides, and the head molded into the form of a typical Tainan figurine head. Characteristic features of the figurine are the oblique eyes shaped like the half of a coffee bean; the molded surface of shaft represents the body of the figurine. (Pl. 55.) Constanza Valley. Earthenware figurines in Santo Domingo differ from what has come to be known as the archaic, in that rarely is the entire body represented, the molding being limited to the representation of head forms only. This particular pestle forms an exception to the general rule because the body and arm or leg members were rarely modeled by the Dominican aboriginal potter. A perforation extends from the back of the neck to the lens or base. Valley of Constanza.

Earthenware pestle: 2 inches (5 centimeters) long; diameter of base 1 inch (2.6 centimeters). No distinguishing characteristic to be noted. Head represents animal figurine; mouth and eyes indicated by incised lines and two punctations. (Pl. 55.) Valley of Constanza.

Undecorated earthenware pestle: 2 inches (5 centimeters) long; diameter of base 1.4 inches (3.4 centimeters). The lens or base has a rounded surface and is bulbous. The curves are continued in the constricted shaft and in the bulbous, undecorated head. Valley of Constanza. (Pl. 55.)

Fragmentary examples of other earthenware pestles collected at Constanza seem to indicate that earthenware pestles were not only

numerous but followed in form and decorative design their prototypes in stone.

Bowls.—An earthenware bowl from Andres habitation site, 14.4 inches (36.7 centimeters) in diameter, 9.3 inches (16 centimeters) in height, has a salmon-colored slip. It is thick walled, globose with narrow truncated bottom and incurved walls above the angular shoulder ridge. Two bilaterally placed snake figurines embellish the decorative zone, while the intervening space on either side is filled with inscribed panels of incised lines separated from each other by short diagonal incised lines and terminal punctations. (Pl. 49.) Figured at one-fourth natural size.

A boat-shaped earthenware bowl, 11.4 inches (29 centimeters) long, 5.9 inches (15 centimeters) high, and 11.5 inches (29.3 centimeters) wide, with truncated flat bottom, incurved walls above angular shoulder ridge; oblong in form, and trencher shaped, terminating in a concave margin resembling a boat. Decoration above shoulder consists of horizontal lines alternating with short transverse lines and terminal punctations. Unfortunately the figurine heads originally applied bilaterally as decorative lugs have been broken off. From Andres, on the Caribbean coast. (Pl. 50.)

Boat-shaped earthenware vessel: 10.4 inches (26.5 centimeters) long; 5.6 inches (14 centimeters) high; 8.1 inches (20.6 centimeters) wide. Red ware, no slip. Lozenge-shaped body with small truncated flat bottom slightly depressed. Decoration appearing only on upper incurved walls above shoulder ridge, consist of bilaterally applied animal figurine heads alternating with curved horizontal lines in series of two with filled-in spaces consisting of short vertical lines and terminal punctations. At the center of each of these series of vertical lines is a nucleated circle. An original feature in the decoration is the position of the animal figurine heads. In "archaic" forms the figurine head peers into the vessel. The outward peering figurine head comes as a later development of design. This bowl represents possibly a still later development in the play of technic, as the figurine head is in a horizontal position with gaze directed sidewise. The added space so obtained makes possible the conventional presentation of the body of the figurine which is effected by means of a raised ribbon of clay terminated by two lesser ribbons representing the legs. A narrow margin free from all decoration separates by means of an incised line the decorative panel encircling the vessel. From Andres. (Pl. 54.)

The globose, round-bottomed black ware bowl (pl. 46), U.S.N.M. No. 349352, is of interest in that it is typical of a ware found represented in shards and fragmentary vessels in the Monte Cristi middens. This boat-shaped example, however, is from the midden at

Andres, found at a depth of 4 feet. The incised line decorative design occupies an encircling panel, separated from the margin by an incised groove; the applied bat figurines at either end appear in high relief above the rim level and are unusual in that both upper and lower limbs are represented. The unusually thin walls, which are less than one-eighth of an inch in thickness, combine with a decorative design consisting of minutely spaced diagonal parallel lines and terminal dots alternating with concentric circles and end figurines in high relief. This black ware is one of the most distinct types of aboriginal Santo Domingan pottery.

In marked contrast with the thin-walled black ware vessel just described is a chocolate-colored, thick-walled, globose bowl resembling pottery types of the Lesser Antilles. Although recovered from the midden at Andres, it reveals no resemblances to other earthenware vessels excavated from the Tainan cemetery and midden at that site. The vessel is unique in form in that the rounded, shallow, cazuelalike body has an almost vertical 2-inch extension of the oral sector equal in height to the walls of the body of the vessel. This extended neck is joined to the walls of the traylike bowl at a distance of one-half inch from the margin, forming a projecting ledge, the vessel giving the impression of a cylinder placed over a saucer. The walls of the vessel reach the unusual thickness of one-fourth inch in section. The paste, unlike that of any other earthenware vessel recovered at Andres, is of a uniform brown color, porous and friable, somewhat of the consistency of pasteboard, resembling in this respect the Eskimo wares. An incised decorative panel encircles the outer surface of the high neck. It consists of five massive encircling grooves broken by occasional short vertical lines. The terminal pit, although infrequently applied, is present and forms the single design linking this bowl (U.S.N.M. No. 349354, pl. 46) with the southeast Santo Domingan wares. An applied figurine head consists of a horizontal beak in high relief flanked by eye punctations, and what appears to be a representation of an aviform ear consisting of a lesser punctation just in front of the eye.

Earthenware bowl, boat-shaped, 5.7 inches (14.5 centimeters) long, 3.4 inches (8.7 centimeters) deep, 5.1 inches (13 centimeters) wide. Patches of a red paint may still be seen on the decorated incurved walls above shoulder. A truncated flat but slightly depressed bottom. The shoulder is angular. The decorative design panel encircling the incurved shoulder consists of short transverse vertical lines alternating with circle and dot and crescent-shaped incised lines. The bilaterally applied figurine heads are of the depressed and conventionalized monkey-face type. Andres. (Pl. 56, second row, right.)

Boat-shaped earthenware vessel, 5.3 inches (13.5 centimeters) long, 3.3 inches (8.3 centimeters) deep, 3.8 inches (9.7 centimeters) wide. There is a pronounced extension of the flat bottom below the rounded walls of the vessel. This forms as near an approach to an annular foot as is ever found in Santo Domingan aboriginal earthenware vessels. The incurved wall above the shoulder ridge is decorated as usual with characteristic Tainan patterns consisting of applied and incised designs; the applied designs being bilaterally placed figurine heads, the incised lines being diagonal, incised lines alternating with circle and dot or nucleated circle designs. Andres. (Pl. 54, upper row, end and profile.)

Boat-shaped earthenware bowl, 5.4 inches (13.7 centimeters) long, 3.8 inches (9.6 centimeters) wide, 3.7 inches (9.4 centimeters) deep. Indications of a chocolate-colored slip remain on the curved sector below the shoulder ridge. Practically no trace of a flattened area which might be called bottom. The incurved walls above the equator or shoulder of the vessel are decorated with deeply cut lines forming concentric rectangles bisected by the shoulder ridge. The usual figurine heads are luted on bilaterally at prow and stern of the boat-shaped vessel. The figurine head handle or lug is reinforced by the retention of a handle loop below the applied figurine head. We might reconstruct a chronological sequence in the history of this form of decoration, beginning with a vertical coiled ribbon of clay molded into the form of a flat loop which later has traced on it etchings representing some animal form. Still later the animal representation is more realistically molded. In a still later stage it appears in conventional form. In each of these stages the original handle loop may or may not be retained. If retained, it is frequently no longer as an actual loop but as a flattened folded clay ribbon, purely decorative. Andres. (Pl. 42, lower row, right.)

Boat-shaped earthenware vessel, length, 3.7 inches (9.4 centimeters), width, 3.4 inches (8.7 centimeters), depth, 2.1 inches (5.3 centimeters). Instead of the usual application of figurine head at either end, this vessel, although diminutive in size, has two pairs of miniature animal figurine heads applied bilaterally. They are of the conventional type of Tainan plastic sculpture consisting of concentric circles and two central excavated pits at the depressed center, the circles appearing in relief, the outer circle being the more prominent. This type of design appears in different forms, sometimes one circle, sometimes several being employed representing eyes with the centrally excavated pits. Andres. (Pl. 52, upper row, end and profile.)

Boat-shaped earthenware bowl, 4.6 inches (11.7 centimeters) long, 4.1 inches (10.5 centimeters) wide, 2.2 inches (5.6 centimeters) deep.

Undecorated except for bilaterally placed inward-gazing figurine heads. This vessel is not boat-shaped like others just described, resembling more the cazuela type of bowl. Patches of a slip in vermilion color appear around the upper margin. Andres. (Pl. 42, lower left.)

Boat-shaped earthenware bowl, 5.5 inches (14 centimeters) long, 4.9 inches (12.5 centimeters) wide, 3.3 inches (8.3 centimeters) deep. Rounded globular walls, including a rounded bottom with but slightly incurved walls above upper shoulder ridge, a peculiarity being the rectangular form of the upper portion of the vessel. Decoration appears, as is the usual Tainan practice, only on the upper incurved walls and consists of diagonally etched lines in series, each terminated with a rounded, deeply incised punctation. Figurine heads at opposite ends of the vessel are flanked with ribbons of clay representing the legs or arms but transversely bisected in such a way as to suggest a serpent design. Andres. (Pl. 42, lower center.)

Rectangular earthenware bowl, 5.7 inches (14.4 centimeters) long, 5.5 inches (14 centimeters) wide, 2.7 inches (7 centimeters) deep. Unusually large flat bottom, globular walls, terminating in a short incurved upper section. Although the margin itself is pronouncedly incurved and oval, a rectangular appearance is given to this vessel by means of knobs luted on at opposite ends. Instead of the usual figurine heads appearing at opposite ends of the vessel there is an indentation where normally there appears a figurine head. No other decoration present. Valley of Constanza. (Pl. 42, lower right.)

Earthenware bowl, 7 inches (17.8 centimeters) diameter by 3 inches (7.7 centimeters) deep. No trace of slip remains. Salmon-colored ware. Thin-walled, smooth-textured, oval and hemispherical in outline with lateral walls continued as rounded bottom. Two large projecting figurine lugs of unusual type, incised with lines and terminal punctations on the inner surface but plain on outer. Small conventional figurine heads cap the central portion of each rectangular lug. Andres. (Pl. 50, center.)

Round earthenware bowl, 5.8 inches (17.2 centimeters) length, 5.7 inches (14.4 centimeters) width, 2.7 inches (7 centimeters) depth. Plain surface with slightly incurved margin. No decoration except one inward-peering figurine head at one end of the bowl. Andres. (Pl. 51, center.)

Round earthenware bowl, 7 inches (17.8 centimeters) long, 5.5 inches (14 centimeters) wide, 2.3 inches (5.7 centimeters) deep. Rounded globular walls, slightly incurved margin, no distinct bottom; plain except for applied figurine heads bilaterally placed and peering inward. Vessels with rounded walls and no pronounced rim have inward-peering figurine heads, while the flat-bottomed and

more elaborately decorated boat-shaped vessels with rudimentary annular base have outward-peering figurine heads applied at sides of vessel near the margin. (Pl. 43, left.)

Earthenware effigy vessel, 7.7 inches (19.6 centimeters) long, 3.7 inches (9.4 centimeters) deep. Red slip, with no evidence of former use. Has a truncated bottom and a low annular base below the shoulder. The plane of the incurved walls is angular. Decoration on incurved upper half of the wall consists of a series of panels, each of which is made up of two concentric oval incised lines alternating with vertical crescent-shaped lines terminating in punctations. The body of the bowl is also the body of the effigy, the head of which appears protruding like a spout from one end of the vessel and the tail as a semicircular ribbon of clay at the other. This vessel is one of the few known forms of effigy vessels from southeastern Santo Domingo. Andres. (Pl. 54, lower row, end and profile.)

Earthenware vase or jar, 4.4 inches (11.2 centimeters) deep, 4.6 inches (11.7 centimeters) maximum diameter. Gourd-shaped with central constriction of the walls dividing the vessel into an upper and lower compartment. Lower section is oval with definitely marked flat bottom and undercoated walls; the upper section is oval and boat-shaped and decorated on the incurved upper shoulder area in characteristic Tainan fashion, with figurine heads at the end and incised lines with terminal punctations forming angular figures and panels at the sides. This type of pottery is reminiscent of the rectangular earthenware of the Iroquois, which is characterized by an overhanging rectangular frieze and irregular boat-shaped margin. Andres. (Pl. 52, middle row, end and profile.)

Earthenware vessel, 3.1 inches (8 centimeters) deep, 4.3 inches (10.9 centimeters) maximum diameter. Oval lower walls with no pronounced bottom section and but slightly marked equatorial region. Angular incised figures appear on the incurved area above the shoulder ridge. There is a deep, slightly outward flaring, undecorated marginal rim. Black ware. Andres. (Pl. 56, lower right.)

Earthenware bowl, 4.7 inches (12 centimeters) maximum diameter, 3 inches (7.7 centimeters) deep. Oval in outline, with no marked bottom section and no pronounced marginal rim. The region above the shoulder is decorated with vertical lines in series forming panels separated by nucleated circles. An incised band sets off the margin from the decorated panel. Andres. (Pl. 56, lower left.)

Earthenware bowl of the cazuela type, 10.8 inches (27.5 centimeters) in diameter, 2.9 inches (7.4 centimeters) deep. Irregular circular shallow bowl with slightly convex walls and short incurved

oral sector, thick-walled, irregularly smoothed outer and inner surfaces. A circular perforation is shown near rim, which at this point has been cut away, leaving a semicircular indentation. Coloring, due to firing, buff, brick color, and black. Slightly marked or ill-defined basal region. From cemetery at Andres. (Pl. 6, upper right.)

Earthenware undecorated bowl of the cazuela type from cave near Constanza, Province of La Vega. Thick-walled, irregularly convexly walled with large flattened basal region and short upright oral section. No clearly defined marginal area. Walls rounded and narrowed around margin. Walls irregularly smoothed and colored by firing to buff and black, with perhaps application of a black slip on inner surface. Diameter 8.9 inches (22.7 centimeters), height 2.3 inches (5.8 centimeters). Exceptionally heavy. (Pl. 6, upper left.)

Earthenware bowl from cemetery at Andres. Height 5.3 inches (13.4 centimeters), diameter 8 inches (20.4 centimeters). No decoration. Smooth as to inner and outer surfaces. Coloring black to buff, due to firing and polishing. Walls strongly convex with well-defined equatorial ridge or shoulder and small poorly defined basal region. Slightly outward curved depressed rim. Bilaterally applied knobbed lugs just above the equatorial or shoulder ridge. Vessel extremely heavy and thick walled. Andres. (Pl. 49, upper row, center.)

Shallow earthenware bowl from cemetery at Andres. Diameter 8.9 inches (22.7 centimeters), height 3.7 inches (9.6 centimeters). Chocolate-colored outer and black-coated inner walls due to application of a slip which has partly flaked off, leaving the inner surface roughened but the outer smooth. Wall has been punctured near the center of bottom. Walls form a continued curve from the oral margin to the center of bottom. The equatorial ridge is poorly marked, as is likewise the incurved rim. A decorative panel encircles the incurved walls above the shoulder. Design effected by free-hand incised lines in alternating horizontal and vertical patterns. Vertical lines have terminal punctations at either end; horizontal lines have scanty application of terminal punctations. (Pl. 51, bottom.)

Earthenware vessel from cemetery at Andres. Height 3.7 inches (9.6 centimeters), diameter 5 inches (12.3 centimeters). An irregularly formed, thin-walled, buff-colored bowl with sharply marked shoulder, irregular flat bottom, and straight undecorated oral sector. Decoration consists of paneling of incised lines appearing between shoulder ridge and incised band encircling margin. Decorative panel consisting of many series of concentric semicircles. Two bilaterally applied lugs have been broken off, but were apparently

loops of coiled clay. This is the crudest example of ceramics from the cemetery at Andres. (Pl. 56, third row, left.)

Earthenware vessel from cemetery at Andres. Height 3.6 inches (9.2 centimeters), diameter 4.9 inches (12.3 centimeters). Thin-walled, smooth surface, black to buff coloring, obtained perhaps by firing. Surface crackled. Bottom is continuation of the convex curve of the walls. A marked shoulder ridge with constriction at neck and unusually large upright rim or oral sector. No decoration and no lugs. (Pl. 56, third row, right.)

Rectangular earthenware bowl from cemetery at Andres. Diameter 6.7 inches (16.8 centimeters), height 3 inches (7.7 centimeters). The convexly rounded walls meet to form bottom. A sharply defined shoulder ridge is bordered with a decorative panel consisting of two bilaterally applied figurine heads gazing inward and of two oppositely placed bilaterally nucleated wens or knobs. The knobs in conjunction with the two figurine heads give the vessel a quadrangular outline heightened by the rectangular margin. Filling the space between the nucleated knobs and the figurine heads are curved and angular incised lines. Coloring obtained partly by firing and burnishing. An excellent example, but fragmentary. (Pl. 6, lower right.)

Earthenware globose bowl from cemetery at Andres. Height 5.7 inches (14.5 centimeters), maximum diameter 8.7 inches (22.2 centimeters). Thin-walled, firmly textured vessel of unusual type, recognizable, however, as typically Tainan in its decorative design. This design consists of the usual paneling of rectangular incised lines with terminal punctations, which in this example appear in series of two or three. Bilateral applications of animal figurines representing some recumbent animal form are highly conventionalized. The convexly rounded walls of the vessel are remarkable in that there appears a constriction near the center where normally in Santo Domingan vessels there appears a marked shoulder ridge, the shoulder ridge in this vessel appearing midway between the constricted area and the upper margin. Coloring is of a deep rich chocolate brown on outer surface, tinged with buff on inner. Walls highly polished and evidence of slip throughout. (Pl. 54, second row, end and profile.)

Earthenware globular vessel from cemetery at Andres. Height 5 inches (12.7 centimeters), maximum diameter 8.2 inches (20.9 centimeters). Like the vessel just described, this example is peculiar because of the thinness of the even-textured, well-fired walls, and because of the banded constriction where normally appears the shoulder ridge. Otherwise this vessel presents a uniformly convexly rounded surface extending from margin to center of body. No decoration except for vertical extension of margin into two bi-

laterally placed rectangular slabs representing some animal form highly conventionalized but plain as to outer surface. (Pl. 50, bottom.)

Earthenware vessel, boat-shaped, 5.7 inches (14.5 centimeters) maximum diameter, 3.3 inches (8.4 centimeters) depth. Tainan type of boat-shaped vessel remarkable for the freedom from decorative design. Smooth-surfaced, even-textured, brick-colored walls convexly molded into flowing curves with no angularity of the high shoulder but with the opposite ends only slightly higher at margin than at the center. Basal section is not marked. Andres. (Pl. 50.)

Griddles for baking cassava are South American, even with regard to form, while the typical North American stone mortar (metate) for the grinding of corn is apparently lacking in the West Indian culture complex. Whatever forms of stone mortar do exist in aboriginal Santo Domingo are divergent types, following Central American stool-shaped patterns; locally developed forms occur in the shape of a rimmed slab somewhat resembling earthenware cassava griddles.

Flat or slightly concave circular smooth-surface earthenware griddles or roasting dishes for baking cassava or maize bread are common to northern South America and to the West Indies. They continue in use to a limited extent among the present-day Dominicans of Santo Domingo; also among the Indians of Mexico. In the pueblo area thin, flat, rectangular parching stones form baking slabs. Apparently the griddle was unknown to the prehistoric inhabitants of the Gulf coast of Florida, and, strangely enough, to the Andean peoples of South America. They are mentioned by Harrington from Cuba, by De Booy from Jamaica and St. Thomas, by Hatt from St. Croix, by Linné from the Pearl Islands, Panama, and by Fewkes from St. Kitts. De Booy also mentions them from Marguerita Island off the Venezuelan coast.

Earthenware griddle from cave near Constanza, Province of La Vega. Diameter 10.2 inches (26 centimeters), thickness 0.7 inch (1.9 centimeters). Chocolate colored with patches of buff and black, the latter perhaps unintentional coloring. A markedly elevated rim, otherwise uniformly level and smooth upper surface; under surface flat with impression of pottery stamp or fabric. An unusually small type of earthenware griddle. (Pl. 53.)

NORTHERN AFFILIATIONS OF SANTO DOMINGAN POTTERY

Some of the problems of West Indian archeology are intimately connected with those of eastern United States, the West Indian Archipelago forming as it does an island chain extending for 1,600 miles in a direct line from the mouth of the Orinoco River and the Venezuelan coast almost to the Florida coast. If we compare this

fact with the known observation as to ocean currents and prevailing winds in the West Indies it may be readily seen that this was a natural watercourse or natural route of migration for South American tribes who had been dislodged from their ancestral home in the interior, either through increasing population, warfare, famine, or some other cause. Cuban Arawak groups actually did migrate to the Florida Peninsula. They also reached the Bahamas, off the coast of Florida, and it is a known historical fact that Columbus engaged the inhabitants or natives of the island of Guanahani as interpreters when he explored the northern coast of Cuba and Santo Domingo.

Hernando d'Escalante Fontaneda, a Spaniard who was wrecked on the Florida reefs and had been captured by the Colusa Indians, remained with them eight years, from 1552 to 1560. He wrote a memoir in which are names of native towns, villages, chiefs, and tribes of Florida. He relates that Indians habitually came across from Florida in search of the fountain of life. These Indians came in such numbers that the king Caloosa, or his father, Sequene, assigned them a particular village in which they should live, telling them it was useless to pursue their quest any farther.

Connection of the island Arawak with Floridian tribes was essentially one of trade and provisioning. Transference of decorative designs, therefore, was incidental to trade contacts. It is nevertheless true that certain Arawakan earthenware designs are typical of the southeastern Atlantic States and occur also elsewhere in North America, but the penetration of Floridian designs within the Greater Antilles remains an obscure problem.

Peter Martyr [33] mentions a species of tree in the Lucayan Islands where many pigeons nest. Indians from Florida came to catch these pigeons and carried boatloads back with them. In Guanahani the Indians knew of a land lying northwest of the Bahamas; also, in Cuba, natives knew of a land mass on the north. The relationship between the so-called coonti flour in native Florida and cassava flour in the Greater Antilles is on a par with other observed culture trait complexes in the two areas. Methods employed in the production of the root flour are similar but elementary and protean. Other examples of Floridian and Antillean culture relationship might be cited and traced to a common culture level proceeding from a common culture origin. For instance, the common wooden seat of the Bahamas occurred in Florida; petaloid celts and monolithic axes extended farther north, and pottery decorative designs of the Antillean type occur widely throughout the Southeastern States. The palm-thatched house of the Seminole Indian is identical with that

[33] De Orbe Novo, p. 251.

of the Arawak of the Greater Antilles. An analogous culture unit of a somewhat different type might be seen in the rough, flat shell beads, shell gouges, and shell dishes of the key population of southern Florida and of the coast fishermen of Santo Domingo and Cuba, while the ornamented discoidal pendant of carved shell occurs alike in Monte Cristi and far off Tennessee and Missouri.

Enough travel and intercourse, principally through trade, however, did develop between the Florida Peninsula and the near-by islands of the Bahamas to acquaint the tribes of the Southeastern States with the culture of the West Indies. It is impossible, however, at this time to state whether the cultivation of Indian corn, which was common to both areas, developed first in the Southeastern States and was then transferred to the West Indies, or whether it was first developed in the West Indies, to be later transferred to the Southeastern States. The same may be said for the culture of the sweet potato, for the making of earthenware, which is remarkably similar, as stated before, in the two areas, and for many other culture traits that might be mentioned. A study of this has recently been made by Charlotte D. Gower, who finds, however, that the greater culture affiliation of the West Indies is with northeastern South America rather than with the southeastern United States. In general the origin of the West Indian pottery is South American rather than Mexican. It is distinct from the painted and more or less modern wares of Venezuela, Guiana, and Brazil.

The pottery subareas in eastern United States have been defined by W. H. Holmes in the Twentieth Annual Report of the Bureau of American Ethnology. A general description of the ceramic wares from the Gulf coast, however, is not a satisfactory description for the different wares that so vividly contrast the eastern and western Floridian types. A most satisfactory comparison of eastern American ceramic wares can therefore be made only in a tabular summary of elements of paste, tempering, form, decorative design, and application of paints. The several tabulations of this character included in this discussion of pottery from Santo Domingo are not at all intended to be comprehensive but afford interesting data for purposes of comparison. They do not, however, afford conclusions, as any evidence deduced pointing toward diffusion of design appears to be offset by a counterset of evidence showing nonrelationship. No matter from what angle the problem is approached, the question of northern and southern affiliations of West Indian ceramics simmers down to a discussion of archaic and postarchaic. Somewhere in the American Continent there arose the art of pottery making along with agriculture and the domestication of typically American animal forms. Supposedly this place of origin is in the valley of Mexico and we

speak of the archaic horizon because of the definite stratification superimposed, because of the clear evidence of great antiquity, and because of the evidence of protean forms and designs, elemental in type, crude in execution, and similar in type to beginnings in pottery manufacture elsewhere, in the islands of the Pacific, and in Europe.

In 1492, on the north coast of Haiti, Columbus found two varieties of pottery at Marien, on the north coast, in the Bay of Acul. The Indians brought water to the ships in earthenware jars. Columbus was also offered maize soup in small earthenware vessels. Herrera speaks of painted forms supposed to have been presented to the brother of Columbus, Bartolome. Bartolome also reported having seen Anacaona's storehouse near the Rio Neiba, where cooking pots and food vessels were stored. None of these early examples known from historical accounts have ever found their way into American or European museums, all the known examples of aboriginal earthenware vessels having been recovered from village sites and cemeteries at various points in the island. More than one-half of the entire number are mentioned or described in this article.

Some heretofore undiscovered elements in Santo Domingan pottery forms and designs may be revealed after further investigation, but it is not at all likely. The following elements characterizing pottery types in eastern United States are of unknown or of exceedingly rare occurrence in Santo Domingo: Impressions made with a wooden or earthenware stamp such as is common in southeastern United States; stamps of wood; pedestal bases; free standing feet or legs with rattles; annular ring bases; supports or pot rests; cord markings or textile markings or any other evidence of fabric imprint on walls of vessel except on bottom of circular griddle from Constanza; pointed or conical bottom resembling the Algonquian type of earthenware vessel; distinct ceremonial ware; double rims; and only a few examples are known of encircling wens on earthenware, but flat punctate decorated rim extensions are present; no vessel with arched handle extending from rim to rim, although many types of looped handles occur; no cord-wrapped potter's paddle, but reticulated impressions of paddle-stamp on shards recovered from Monte Cristi; likewise no earthenware beads, ear plugs, or pendants. The rectangular burial casket of earthenware or burial in stone cyst is unknown.

No fragmentary evidence of the use of grains of corn or of corncobs or of decorative designs using the corn motive have ever been recovered in connection with food bowls, such as is frequently the case with pottery from the Southwest and in Peru. The drawing by John White depicting an Indian woman of Florida with earthenware bowl and ears of corn shows an earthenware form of the

cazuela or flat shallow-bottomed vessel without handles or decorative embellishment similar to that from Cuba and Santo Domingo. Similarly, no large containers showing cord impressions similar to the large salt jars used in Tennessee have been found.

Rattles have been found in considerable quantity by the writer in Samana, Monte Cristi, and on the Caribbean coast at Andres. However, these were not free objects such as occur in the middle Mississippi Valley, nor attached to pottery vessels as leg supports as in Panama and the Lesser Antilles, but in every case were applied as handles, or shaped into earthenware figurine heads serving as lugs to earthenware vessels. Likewise the presence of small stone pebbles rather than of clay pellets is to be noted in the Santo Domingo rattles. No spool-shaped or hourglass-shaped earthenware forms resembling modeling tools or trowels as in Gulf Coast States have been recovered, although several small pestlelike earthenware forms with flaring rounded base are now in the United States National Museum from Santo Domingo.

Urns containing fragmentary and intact skulls have been recovered by the writer in Samana and La Vega Provinces. As in the Southeast, urn burial is secondary, as only some of the long bones and skulls were included within the urns. At Samana earthenware urn burial with covering of bowls was observed at Anadel similar to that known from Georgia and Alabama. Santo Domingo has no mortuary vases with a portrait death mask like those from the middle Mississippi Valley; neither are there any toylike vessels, "extemporized earthenware," or small animal figurines used as burial offerings as in Florida. One small animal figurine of black-colored earthenware was dug up in a kitchen midden at Constanza, but none were found in cemeteries. The realism of the Southeast, also the richness of form of Mexican examples, is wanting. Isolated, free-standing or toylike figurines representing, for example, a baby and cradle board; or small earthenware figures suggesting modelings from the Mexican archaic; or small earthenware images of a turtle, frog, or other animal forms have not been found in Santo Domingo, although highly artistic examples of such forms appear in wood, stone, or shell. Personal ornaments of earthenware so characteristic of the middle and lower Mississippi Valley, including beads, pendants, labrets, ear plugs, etc., have not been seen in Santo Domingo. Pottery disks, such as those recovered in the Ohio Valley and in Kentucky, perhaps used in playing games, do not occur in Santo Domingo. However, several lozenge-shaped or spherical pottery disks, apparently spindle whorls and divination tops, do occur and have been recovered by the writer in Samana and Monte Cristi Provinces. The large number of pottery circular disk stamps have been ade-

quately described from the several native Provinces of Seibo, Samana, Monte Cristi, and Macoris.

The earthenware tobacco bowl pipe occurs in no form in Santo Domingo, although generally present in Florida and in the southeastern Gulf States. A bifurcated bone snuffing tube was employed instead of the tobacco pipe. This is one of the strongest links showing Chibchan rather than Muskhogean or Timucuan influence.

The use of a basket in modeling apparently was unknown to the aboriginal potter in Santo Domingo; in fact the use of molds generally as practiced by Mexican artisans and Pueblo Indians of a later period is unknown. Impressions resulting from the use of pliable wrappings of material sustaining the vessel while plastic have been found in the grass or matting impressions on the underside of circular earthenware cassava bread griddles and roasting dishes. The many earthenware forms from the mounds of the Carolinas showing impressions of cord-wrapped potter's paddle or malleating tool is not paralleled in Santo Domingan finds. The presence of a notched wheel or of a roulette design, clearly established in Florida and neighboring States, is lacking in the numerous banded punctate designs from Monte Cristi Province. Finger-nail markings used to obtain a certain decorative effect as in the corrugated ware from the Southwest are practically unknown in Santo Domingan ware. This does not exclude thumb and finger-nail prints of the potter accidentally remaining on the unsmoothed surface.

The classification of Indian pottery from eastern and central United States presented by Holmes in the Twentieth Annual Report of the Bureau of American Ethnology defines the pottery of eastern United States, inclusive of the Mississippi Valley, as readily falling into five groups. The group nearest the Bahamas and the Greater Antilles he designates as the South Appalachian group; while the aboriginal pottery from North Carolina and adjoining States of the Atlantic coast are classified as the Middle and Northern Atlantic Slope group. The Northwest group, the Iroquois group, and the Middle Mississippi Valley group are the more remote pottery subareas in this regional classification and differ markedly from the forms known to us from Santo Domingo, although many of the forms figured by Holmes in Plates 5, 9, 12, 14, 23, 26, 27, 28, 35, 44, and 45, belonging to the Middle Mississippi Valley group, might well have been derived from Santo Domingo, while the curvilinear etched designs from the Lower Mississippi Valley group are still more striking in their resemblance to Santo Domingan forms. The resemblances in the vessel forms are particularly worthy of note.

The pottery of the Gulf coast should be of primary interest in this respect, as it shows the most striking resemblance to pottery forms from Santo Domingo. Note should be taken of the vessels, including large bowls with incised designs, figured in Holmes's Plates 55, 60, 61, 65, 67, 68, 70, particularly the specimen marked "*c*" in plate 70; also plates 72, 73, 74, 75, 76, 77; the water bottle marked "6" in plate 79 *b*, also plates 84, 87, 101, 110.

Strangely similar are vases from a grave in northern Pennsylvania belonging to the Iroquoian group figured in Plate 146. These vessels are noteworthy in that they have a rounded base and globular walls; a central constriction and an upper oral sector with lozenge or rectangular 4-lobed bulging frieze and wavy or scalloped margin. Similar vessels occur in the island of Santo Domingo, particularly on the Caribbean southeast coast. (Pl. 54.) Such vessels, from the Arawak of Santo Domingo and the Iroquois of New York and Pennsylvania, are similar in form and in decorative design so far as pertains to the incised decoration, differing in certain details only. Figurine heads of an anthropomorphic type occurring on the Iroquoian vases bear a striking resemblance to the figurine heads similarly placed on certain Santo Domingan forms. It scarcely gives an accurate picture, however, to single out this one form of vase which is decidedly the most characteristic form of Iroquoian ware, thus disregarding the many dissimilar Tainan forms, also such Iroquoian objects as the earthenware bowl pipe which does not occur at all in Santo Domingo. We must furthermore admit that the globular vessel just described with overhanging scalloped frieze, like the upper deck of an old galleon, occurs also in Florida and elsewhere on the Gulf coast.

The pottery forms of the Middle and North Atlantic Slope group, although they bear some resemblance to Iroquoian and Santo Domingan forms, in the character of their incised decoration, nevertheless are of a distinct group. The Algonquian conical vessel with pointed bottom, wavy rim, and dissimilar form of applied decorative motif is most characteristic of the Algonquian coast area.

Pottery from the Middle Mississippi Valley group again has certain resemblances to Santo Domingan aboriginal earthenware, but also certain other striking dissimilarities, both as to form and as to decoration. For instance, a similarity may be noted between Santo Domingan and Tennesseean incised angular geometric designs, but dissimilarities become at once apparent if we consider the arched handle from Tennessee mound pottery, the shoe-shaped forms and the many rows of encircling knobs occurring as decorative embellishments on Tennesseean forms. Likewise the Middle Mississippi type affords certain similarities in banded circular and spiral incised designs, from the Ohio Valley group, which design, however, ap-

pears elsewhere on the Gulf coast as well. This similarity is offset by the dissimilar pedestal base of the Ohio Valley group and in the bulging midsection in the body of certain typical Ohio Valley mound vessels. Flat loop handles occurring four to the vessel, however, appear both in Santo Domingo and the Ohio Valley groups, also in Florida.

Certain similarities in the decorations of the incised and stamped forms from the Northwest group in Illinois, however, take us too far afield; here even the incised ware is entirely dominated by such extraneous features as roulette designs and the cord and textile decorated ware of Wisconsin. A rather startling coincidence is a striking similarity in pottery from the Northwest group belonging to the Mandan Indians of Dakota in the vessel marked *b* figured in Plate 176 of the Twentieth Annual Report of the Bureau of American Ethnology. Identity in design with Santo Domingan forms is noted both in the incipient etched decorative design of banded spirals and in the flat-looped handle lugs. That similarities should exist in such widely separated aboriginal pottery areas as Santo Domingo and Dakota may be ascribed to the elementary nature of all incised decorative designs to which belong simple forms of the spiral. A similar problem is afforded by the incised designs on earthenware vessels from a Pawnee village site in Nebraska, figured in Plate 177 of the Twentieth Annual Report of the Bureau of American Ethnology.

Pottery is still made by the Cherokee and Catawba Indians of North and South Carolina. A collection of modern pottery from these tribes now in the United States National Museum shows the careless use of the curvilinear stamp and but faint traces of ancient pottery forms. The influence of modern culture has introduced many new forms, such as wall brackets, flower vases, book ends, and others. The typical historical pottery of different areas in the Southeast varies in form, paste, temper, color, decoration, and paint. On the basis of these distinctions we may speak of the stamped curvilinear designs as common prehistoric pottery from Georgia and Florida; of incised lines in free-hand or carelessly made punctations as characteristic of mound pottery from eastern Mississippi; or we may speak of the mound pottery from western and central Mississippi as characterized by a decorative design of curved bands of finely incised parallel lines made by trailing; roulette incised forms are characteristic of western Florida and the Alabama coast.

Applied decorative design likewise varies from area to area, ranging from the crudely modeled figurines, principally of animals and birds, from the east coast of Florida to the highly conventionalized art of realistic modeling of the human head with realistic facial

features which was practiced by the tribes of Arkansas and eastern Tennessee. A peculiar combination of applied and free-hand geometric incised design, together with distinctive technic, notably the overhanging marginal frieze, giving an angular effect to a globose bowl or jar, characteristic of Iroquoian prehistoric forms, sets off the Iroquoian area again as distinct from that of other areas in the eastern United States, centering about New York and Pennsylvania and extending in places into Canada.

Perhaps the most important group of wares come from the middle Mississippi Valley. These are characterized by plastic modeling of the human head in realistic and artistic style, also by a richness of effigy forms, which is delimited by the marginal pottery forms coming from the upper Mississippi or the Northwest. The Ohio Valley also offers distinct forms. Then we have the typical Algonquian ware with the conical base, and wavy oral margin, also the South Appalachian ware. The Gulf coast ware appears to have more subdivisions and areas of local development in form and design. Some of these groups of pottery forms are so distinctive as to make classification easy, for instance the free-hand modeled animal figurines from the east coast of Florida, or the peculiar style of curvilinear roulette punctated design from the Florida west coast characterized by the finds made by Fewkes at Weeden Island. So far as is known, not one of the areas here cited makes use solely of incised or applied decorative forms. Everywhere we have a combination of the two, as in Santo Domingo.

If we refer to a Gulf coast type of pottery we would perhaps single out the tribes occupying the coast east of the delta of the Mississippi and extending to northern Florida. This is perhaps the traditional home or historical habitat of the Muskhogean tribes but was occupied by branches of the Sioux as well. Here appear stamped designs so characteristic of the area somewhat farther east. Animal features are modeled in relief and are attached to the vases and bowls or are incorporated in the walls of the vessel as in the middle Mississippi area, but much less frequently. We also find here the beginning of the practice of "killing" the pottery placed in graves as grave offerings. This custom, as is well known, extended eastward to Florida and the Atlantic coast, but was not practiced in the middle Mississippi Valley area, or in Santo Domingo.

Identity in form and in ornamental features with Santo Domingan wares does appear in Gulf coast pottery. A sample specimen of this, figured by Holmes in the Twentieth Annual Report of the Bureau of American Ethnology, Plate 55 *a*, from Georgia, has compressed rounded wall with truncated bottom, well-marked equatorial ridge and short, sharply defined incurved upper portion covered with

an ornamental zone of incised meandered curvilinear and straight lines terminating in incised whorls or nucleated circles. This type of vessel appears very frequently in collections of unpainted terracotta ware from many sites in Porto Rico and in Santo Domingo. Applied bird head figurines from this area, however, have a style different from the bird heads on Santo Domingan pottery. This is characterized in the more sophisticated modeling of the beak with a greater detail, such as crosshatching and relief paneling, intaglio surfaces, giving a generally more realistic effect. The same applies to modeled heads of anthropomorphic type, all of which from the Alabama Gulf coast show more realism than do those from Santo Domingo. Incised meanders forming incomplete scrolls, T-shaped figures, worm or snakelike representation, nucleated circle, meandered bands filled with strips of plain color or punctation, all characteristic of the area, are similar to Santo Domingan forms. Applied flat handles, either in pairs or at right angles, are infrequent on the Gulf coast, though quite common on the Atlantic coast of Santo Domingo. Shallow bowls with incurved rims and rounded bottom have incised decorative panels of parallel horizontal and curvilinear patterns identical on the Florida north coast and on the north coast of Santo Domingo. (Holmes, pl. 70, *c*, Twentieth Annual Report of the Bureau of American Ethnology.)

We have here also the 2-compartment, or the superimposed shallow vessel fitted to the upper rim of another vessel, both of which are covered either in whole or in part with angular or meandered curvilinear incised line pattern. Wavy or scalloped rim sectors also appear. These vessels occurring in the Gulf coast are practically identical with Iroquoian forms from central New York and Dominican forms from Andres. Two horizontal compartment vessels separated by a diaphragm and surmounted at the center with figurine heads occur here for the first time in the form almost identical with 2-compartment bowls surmounted by figurine head from the Provinces of Samana and Monte Cristi. Flat shallow bowls with bird figurine heads at the margin appear to be closely related in Floridian forms and in those from the Dominican sites. Perhaps the most common form of bird represented is the owl, with its peculiar triangular head form indicated in simple outline. (Holmes, pl. 74, *a*, *b*, *c*, Twentieth Annual Report of the Bureau of American Enthnology.)

Decorative zones of design formed by pinching the clay while still plastic alternate with stamped designs on the upper outer surface of vessels from the Gulf coast of Florida. Both of these types of decorative design, however, do not appear in Santo Domingo.

Mammiform projections with incised decorative bands similar to the bulbous extension on heart-shaped water bottles from Santo Domingo are characteristic of the Florida Gulf coast. A form of vase or water bottle entirely different from that of the middle Mississippi Valley resembles similar exceptional forms from Monte Cristi (pl. 17) on the northern coast of Santo Domingo. In this, as well as in other areas of southeastern United States, the incised lines are more protean on the one hand and more conventionalized on the other than are the applied forms. Realistic incised forms on the Florida coast include such animal forms as the eagle and the snake.

Certain primary forms of realism appear in sequence in the two areas under comparison, one end of the sequence being a realistic version, the other highly conventionalized or distorted, or appearing only in part. A bird figure representing, say, a bat, might form a series with a clearly recognizable bat head, either incised or in relief, with flanking symbols clearly recognizable as wings or bird claws. At the other end of the series we have merely a geometrical border or incised band filled in with triangular figures representing bat heads, also with characters representing perhaps either bird claws or tracks of bird feet. In the decorative embellishment on earthenware from Santo Domingo, occasionally a beak, two eyes, perhaps a foot or claw, stands for the entire figure. A head sharply defined, either etched or in relief, flanked by applied ribbons of clay with clearly modeled terminal hands, feet, or claws represents the entire animal. Many series from realism at one end to conventionalized shorthand in art, so to speak, at the other may be recognized both in the Gulf coast and Dominican areas, the bat, frog, monkey, lizard, snake, many forms of the owl, parrot, and other animal concepts being clearly recognizable.

Globose vessels with extended rim frieze resembling a 2-vessel combination, with one placed on top of the other, the constricted bottom sector of the upper being removed and the walls joined with the lower vessel to form a constricted neck, as mentioned before, appear alike in vessels from the Dominican southeast coast, from the northwest coast of Florida, and from Iroquoian sites. These examples have diagonal line etchings and figurine head modelings appearing at the sides near the lip and above the constricted neck sector.

Effigy bowls representing the owl with head and tail oppositely placed near the margin, but with incised paneled designs representing wings appearing at the sides above the pole of the bowl, occur alike as Santo Domingan and Floridian cemetery finds.

Two-compartment, hemispherical bowls, joined with a diaphragm, occur in Florida and Santo Domingo, but are dissimilar in such de-

tails as thickness of walls, rim, and bottom, the Florida example being more ponderous than the red ware Dominican example.

Certain convolute stamped designs from the South Appalachian ceramic group, notably the stamped collar design from Florida and Arkansas; banded incised scrolls from Black Warrior River, Ark.; large indented pits and handles from the Black Warrior River; handles on globular vessels from the same area; crude line and punctate designs combined with applied handles from Hickory Bluff mound, De Soto County; incised lines and terminal dot or pitted designs from pottery deposits in shell mounds—all these are identical with Santo Domingan designs from the midden material of the north coast.

Earthenware vessels from Franklin Parish, La., have crudely incised banded crescents forming a decorative panel encircling the oral sector; vertically incised short lines encircling the vessel resemble Santo Domingan forms from Andres, on the Caribbean.

Much of the Gulf pottery is incised or painted over the entire outer wall surface, while Santo Domingan forms have encircling panels only, usually set off from the remainder of the vessel with an incised band. The panel comprising the decorative embellishment lies near the rim and never extends below the equatorial ridge to the incurved lower walls.

Floridian earthenware forms and decorative or representative designs might be expected to yield a certain resemblance to Santo Domingan wares because of proximity and historical records of actual intercourse of Floridian Calusa and Antillean Arawak tribes.

Tempering materials in Floridian wares consist of fibrous vegetable or root materials; sand; pulverized rock and shell; or in some wares of no artificial tempering objects at all, recourse being had to a naturally tempered clay. In Santo Domingo earthenware forms show a great similarity in tempering materials, as crushed stone, pebbles, and a natural sand.

Similarities in Santo Domingan and Floridian and Gulf coast wares are frequently to be seen in the cruder, less sophisticated designs, such as might crop out in primitive pottery forms and designs of any two pottery-making areas. Such forms as flat-bottomed or shallow globose and spherical bowls with flattened or rounded bottoms, bottles with tall cylindrical necks, flaring or straight rims or lips are often identical in the two areas. Likewise, etched lines in parallel, diagonal, curvilinear, scrolled, and other meandered patterns are commonly identical in the two areas. Bands of round, flat-bottomed, also tear-shaped punctations, are likewise shared in the areas compared, although the roulette and figured punched designs appear on Floridian ware only, while incised lines and terminal pit designs appear only on Santo Domingan vessels.

The numerous forms and incised decorative designs blossoming out in Floridian pottery ascribable to a rich mythology of intensive centers of pottery production are balanced by numerous applied ornaments on Santo Domingan ware. Few of the so-called grotesque figurine heads appear in Florida designs, and then only occasionally. The 3-pointed bat or owl head figurine is an example of a figurine type occurring in both areas. Handles, which are the utilitarian base for the decorative figurine heads in Santo Domingan ware, are rare in Florida. This may account for the scarcity of figurine heads similar to Santo Domingan forms.

In a review of northern and southern affiliations of Antillean culture Charlotte D. Gower cites the conclusions of several students in reaching her own conclusion that "A general survey of pottery forms in the Antilles and the Southeast leaves an impression that there is not a sharp break between the two regions, though specific identities are hard to find." For every definite example of identity in ceramic wares we must refer to many other examples of dissimilarity in form and design from the same subarea. Thus, in the Twentieth Annual Report of the Bureau of American Ethnology, the bowl marked "*e*" on Plate 76 is identical; with it appear examples of two other decorative embellishments foreign to the Greater Antilles. One of the bowls (*d*) has a decorative zone formed by pinching the plastic clay with the thumb, while the vase (*b*) shows a decorative zone marked with the promiscuous stamp design characteristic of the South Appalachian area but foreign to the Greater Antilles. In Plate 79, *b*, a water jar marked "6" from the Florida northwest coast is identical in form and strongly resembles in decorative embellishment water jars from Monte Cristi Province. Yet in the same plate Holmes figures five other water jars from the same northwest Florida coast, each with a form and decorative design totally different from that of Santo Domingan village sites or burial offerings. In Plate 110, *d*, likewise appears a shard from Tampa Bay, Fla. The shard has an incised decorative design forming a continuous spiral encircling the vessel just below the marginal incised band. This free-hand incised form of design is identical with similar designs on pots from the north and northeast coasts of Santo Domingo. Yet in the same plate are figured examples of pinched decorative design and of shards showing a peculiar combination of meandered bands foreign to Santo Domingan pottery, of punctations characteristic of the northern coastal sites of Santo Domingo.

The famous vase first cited by Doctor Holmes in the American Anthropologist, volume 7, January, 1894, was similar in design to a vase found in a mound in Franklin County, Fla., and a design carved from the seat of a wooden stool from Turks Island. It would ap-

pear that this famous example of identity in Antillean-Floridian culture is the same design as has been figured by MacCurdy in the American Anthropologist, volume 15, No. 4, October–December, 1913, on a vase from Chiriqui. MacCurdy calls this design the octopus motif. Holmes had previously designated it as a highly conventionalized alligator derivative. The same design of double convolutes centered about an incised circle appears on potsherds collected by the writer both on the north coast and in the interior of Santo Domingo. It appears, then, that this rather complex design has a much wider range than would be the case if it were merely a design such as had infiltrated from the Greater Antilles to the southeastern United States. Along with many other protean ornamental embellishments this octopus motif (we might call it a conventionalized turtle design) had a multiple origin. (Pl. 4.)

Three disturbing features in decorative design from that section of the southeastern United States most contiguous to Santo Domingo are also most characteristic of the area, namely, pinching of the plastic clay to form vertical nodes and ridges in lieu of punctations; second, the roulette punctations which appear in curvilinear geometric forms filling in the entire decorative zone on the incurved upper slope of the vessel; third, the promiscuous use of wooden stamps, the faces of which are engraved with various designs embracing figures in complex and often pleasing design, but foreign to Santo Domingan decorative motifs. The high development and perfection of these modeling tools is disturbed by the method of their application, which leaves confused impressions scattered rather promiscuously over the surface of the vase in such a way as to destroy the beauty of the original stamp design.

Doctor Fewkes is of the opinion that the curvilinear roulette punctations appearing throughout the Floridian and Appalachian area, and which he studied intensively in his Weeden Island work, are foreign to the Antillean area. In conclusion he states in regard to the Weeden Island pottery, "When we compare the Floridian pottery with the highest decorated ceramics from the West Indies we find considerable difference between it and that of Cuba, Santo Domingo, and Porto Rico, where ceramic art reached its highest efflorescence, and are unable to refer it to the Antillean, but the crude pottery of the lower stratum resembles that of the lower stratum of the West Indies. * * * There is no likeness between the decorative pottery of Weeden Island and the so-called Tainan ware of the Antilles. Whatever relationship exists between Floridian and Antillean ceramics is found in the ancient forms or those found in the lower strata. In the absence of knowledge as to the relationship of the people who inhabited the Weeden Island and the Indians found on Tampa Bay by the Spaniards we can not say

whether they were ancestors of the Calusa or Timucuan. This determination awaits further study."

Fewkes is of the opinion that the decoration of Florida pottery is a survival of that used in the decorative technic of calabashes or that the ornamentation of gourds and calabashes has been taken as a motive for the decoration of pottery. In the absence of clear-cut stratigraphical distinction in the pottery finds from the Florida-Appalachian area we must accept the historical method of assuming that aboriginal cultures are more or less static unless proof is at hand to the contrary. Of course, as is well known, in any area of intensive pottery manufacture recourse is had for decorative motivation to life forms existing in the environment. It is, therefore, natural to expect a greater variety of zoomorphic representations when we compare with the pottery from an area as poor in mammalian forms as is the case in aboriginal Santo Domingo. The turtle, rattlesnake, deer, bear, beaver, are but a few examples of life forms that we need not expect in examining West Indian pottery. Combining a tribal mythology rich in animal lore with a ritual and primitive religion intimately connected with animal life one may readily see how an ornamentation may grow up in any ceramic subarea entirely different from that of another with which it was originally closely associated.

The geometrical designs appearing on Floridian pottery, chiefly those forms derived from the west coast, are spirals, ovals, scrolls, circles, and rectangular figures, also parallel lines, all executed in a peculiar roulette form of punctated design. Much of this punctation is free-hand but the punctations always give the impression of trailing and are not clear-cut with oval or rounded walls and flat bottoms as is the case in punctated designs from the north coast of Santo Domingo. Curved or straight incised lines in Floridian west-coast pottery are often terminated with a puncture, usually triangular in form, while in the Santo Domingan forms the puncture is nearly always round. This puncture with rounded walls and flat bottom appears also in Floridian west-coast pottery in isolation, when it is usually larger than punctations appearing in series. A somewhat similar indentation occurs rarely in pottery from Santo Domingo. The stamped designs from Florida, like those from other parts of the Appalachian area, appear in geometrical figures, including squares, rectangles, curved lines, spirals, and crosshatching.

In reference to stratigraphical work in the West Indies, much stress has been laid on the culture of the supposedly pre-Arawakan Guanahatibibes or Ciboney. Most writers on the Ciboney are not quite sure in their own minds whether these culturally supposedly impoverished aborigines made pottery or not. It fits in well with

any scheme of culture sequence or hypothesis regarding the crude pottery forms frequently appearing in village sites and in caves in Santo Domingo and in Cuba to attribute such undecorated pottery form to a prepottery or early pottery-making tribe. J. R. Swanton [34] thinks that not enough of the language of the Ciboneys has been preserved to enable us to state positively that they were distinct from the Arawak. This theory is substantiated in the fact that finds of the cruder forms of pottery are never isolated but always occur in conjunction with the more elaborate Arawak forms. This holds true regardless of whether the crude pottery is from a cave containing other supposedly Ciboney artifacts or from open village sites.

Harrington remarks regarding possible culture contacts between the tribes of the southeastern United States, of Yucatan, and those of the Antilles that—

> The writer has yet to see a single object from Cuba suggesting the Maya art of Yucatan. With regard to the southeastern part of the United States, what little influence there was among the more advanced peoples seems to have passed from the islands to the mainland, and not vice versa, for we find throughout the area covered by the "southeastern" type of culture, from the Gulf to Tennessee, and from the Atlantic to eastern Texas, the typical Tainan type of bowl—the cazuela. Cushing apparently had in mind certain similarly hypothetical primitive Antillean culture influences of the Ciboney type.[35] It is a curious fact that of all the pottery discovered by us actually in the muck deposits of Key Marco, only tray-shaped vessels, and either shallow or hemispherical and deep, sooty, cooking, or heating bowls of black earthenware, were found. Nearly all were crushed. One small shallow bowl contained a thick mass of black rubber gum intermixed with crushed shell and other substance of precisely the kind that was used for cement and paint material. Other and larger examples contain almost equally thick coatings of partly charred food, inside, and incrustations of soot outside. Only a single ornamental fragment was found. This was the conventionalized figurehead of a crested bird, quite such as is found on many of the traylike bowls of earthenware from the ancient mounds of the Mississippi Valley. But it had been drilled and reshaped, to some extent, to serve as a weight or pendant.

Similarities in Floridian and Santo Domingan earthenware forms and decorative designs do not pertain to ceremonial identity of origin but show identity of ornamental technic and shape. Some of these features listed here are significant of an early or recent cultural diffusion; others show merely an orderly development in pottery decorative art such as would naturally take place among peoples having reached a common degree of enlightenment. The following examples are selected at random and their number might be increased almost indefinitely.

---

[34] Southern Contacts of the Indians North of the Gulf of Mexico. Twentieth Congr. Int. Americanistas, Rio de Janeiro, 1922.

[35] Cushing, F. H., A Preliminary Report on the Exploration of Ancient Key-Dweller Remains on the Gulf Coast of Florida. Proc. Amer. Philos. Soc., vol. 35, no. 153, 1897.

In examples of earthenware from the Floridian northwest coast appear isolated crosses incised on the rim sector or on projecting wen or handle knob. This feature, in decorative embellishment, appears in identical form on handle lug, knobbed excrescence, or rim sector in Santo Domingan vessels from the north coast.

Alabama River pottery has a decorative design consisting of over and under passes of series of curvilinear lines; punctated designs; urn burial in capped vessels; alternate panels of diagonal incised lines and punctations; also water bottles with cylindrical neck. Santo Domingo earthenware shares these traits of design and form.

Along with the several elaborate designs found in the Moundville pottery, such as scrolled figures and incised designs, a conventionally incised serpent form, and incised bird designs, appear effigy vases identical with Porto Rican and Santo Domingan aboriginal forms.

Owl designs in form of a triangular modeled figure and appearing as a handle to a vessel with eye forms represented by two concentric incised circles appear alike on Floridian northwest coast pottery and on Santo Domingan vessels.

CHARACTERIZATION OF DIVERGENT POTTERY GROUPS IN THE ANTILLES

Aboriginal pottery of the Bahamas.—In describing Arawak pottery from Caicos Island, in the Bahamas, De Booy [36] refers to the over and under trailed decorative patterns in flat relief, resembling a linked cross, or swastika design, a decorative embellishment of rare occurrence in Santo Domingo. A similar pattern appears on a clay stamp from a Franklin County (Fla.) mound, also on Alabama River pottery in series of curvilinear over and under passes. The pattern also appears as an element of textile design from South America, and as a painted decorative pattern passing over and under like the links of a chain on earthenware from Curaçao. The same linked "swastika" design is current in the European Balkans, also on the Nigerian coast of West Africa. This link pattern, however, has not been observed in aboriginal forms of the cross incised on aboriginal Santo Domingan pottery, therefore exemplifying one of several distinctions that might be drawn between ancient Lucayan or Bahaman decorative designs and those from the island of Santo Domingo.

The classic example of identity of incised design in the contiguous Bahaman and Floridian areas (pl. 4), first mentioned by Holmes,[37] and generally accepted as evidence of direct culture contact within the two areas, is after all an elementary conventionalization of a life

[36] Booy, Theodoor de, Lucayan Remains on the Caicos Island.

[37] Holmes, W. H. Caribbean Influence in the Prehistoric Art of Southern States, Amer. Anthrop, vol. 7, pp. 71–79, January, 1894.

form, perhaps of a turtle. MacCurdy figures a similar design from Chiriqui, Panama. It reappears as a banded incised decoration on gray-ware water-bottle necks from Monte Cristi Province. (Pl. 37.) The same recurved volute figure reappears as a painted design on pottery from St. Kitts. In other details of aboriginal pottery forms and designs the Bahamas appear more closely linked with the Porto Rican-Santo Domingan pottery area than with the peninsula of Florida.

Aboriginal pottery of Cuba.—Cuban aboriginal earthenware is imperfectly known and no extensive series of vessels exists anywhere in museum collections. It consists of shallow, flat bowls incised on inner margin; also of globose bowls with sharply defined shoulder ridge and straight-walled sides forming angles with the equatorial ridge, while the walls below the shoulder are convexly rounded. Boat-shaped vessels, plain like Jamaican funerary vessels, also like those described by Fewkes from Porto Rico and by De Booy from St. Croix, are most typical forms. Figurine heads of burnt clay are applied on shallow, flat bowls as in Santo Domingo. The figurines have eye forms either of simple punctated or of the coffee-bean type flanked with clay ribbons representing arms or other members of the body. Nostrils may be represented or not; mouth is represented by means of a bisected oblong clay knob of coffee-bean type, or of a simple horizontal incised line; headdress is represented by noded clay ribbons and lobed projections; face is modeled in concentric circular planes. In the decorated globose bowls the figurine heads with loop handles attached project above the upper rim.

As in Santo Domingo, the white slipped ware is superior to the terra cotta and buff wares in hardness of paste, in the thorough pulverization of the ingredients, and in smoothness of surface finish. Except, then, for the plain trencher-shaped vessels (pl. 44), which resembles Jamaican types (pl. 42), Cuban aboriginal pottery, so far as is known, is identical with that of Santo Domingo.

M. R. Harrington, who stresses the distinctions supposedly existing between the Ciboney of Cuba and Tainan cultures generally, notes certain features and elements of Ciboney pottery:

> Pottery of any kind is very rare on Ciboney sites, exceept in certain cases where it is found on or near the surface and is obviously Tainan and intrusive but once in a while, as at the early village site at Mesa Buena Vista, near Jauco, may be found sherds, usaully plain, but sometimes decorated with simple angular patterns, of rather crude vessels which seem to have been of flattened globular form, like the more recent Pinar del Rio vessels shown in Figure 93, or of the type known as boat shaped, oval in outline and pointed at both ends. Now, semiglobular and boat-shaped forms and angular patterns are by no means unknown to Tainan ware, although they are not common;

yet it seems significant that such forms and such patterns, and these only, should be found apparently associated with the Ciboney culture.[33]

It would appear from this that whether Ciboney or Taino, plain, trencher-shaped earthenware vessels are characteristic of Cuba to a greater degree than to Santo Domingo.

Cuban aboriginal ceramic wares, like those from other islands of the Greater Antilles, are conceived in a different style and executed with a technic distinct from that of the Lesser Antilles. Perhaps the outstanding difference is in form. The heavy walls of such vessels as the painted bowl (U.S.N.M. No. 229777, pl. 45), from the island of St. Kitts, may be compared with the thin-sectioned walls of two earthenware bowls from Cape Maise, Santiago Province, Cuba, collected by C. J. Frye. These vessels (U.S.N.M. Nos. 215405–6, pl. 44) resemble rather strongly the Jamaican plain trencher-shaped vessels. A characteristic feature of these bowls is the clay slab lugs applied obliquely to the rim coils at opposite ends. On one of the bowls (U.S.N.M. No. 215405) incised lines appear on the inner surface of the lugs; lugs of the other bowl have scalloped edges. A single perforation transfixes each lug in much the same manner as are the loop handle lugs on Monte Cristi terra-cotta shallow bowls. U.S.N.M. No. 215405 is globose, trencher-shaped black ware with chocolate colored sides. Shoulder is faintly indicated; bottom is rounded. The outer surface is roughened, with tempering pebbles protruding, inner surface fairly smooth. Dimensions: 10.4 inches diameter at shoulder, 4.1 inches deep, and 11.6 inches in length from lug to lug.

The more oval, plain, globose trencher-shaped bowl (U.S.N.M. No. 251406) has a sharply defined shoulder and rounded bottom. Surfaces are burnished, but here, too, shell and pebbles used as a temper occasionally protrude from the thin walls. The vessel is a brick-colored terra cotta. Dimensions: 10.7 inches in length at shoulder, 9.5 inches wide, and 5.3 inches deep.

Jamaican aboriginal earthenware.—Jamaican ware is unique among Antillean earthenware in that it is thin walled, considering the size of the vessels. Boat-shaped light buff or yellow colored funerary vessels containing cranial fragments from a cave near Kingston, Jamaica, now in the Museum collection (pls. 40–42), are typical of this ware. Characteristic of Jamaican figurine heads are the large modeled eye sockets. Another characteristic of Jamaican figurine heads is the absence of the grotesque. Also lacking is the so-called monkey type, consisting of concentric incised lines and relief features characterized by compressed center but a bulging bottom and top. The aviform or triangular bat-shaped head, as in

[33] Cuba before Columbus. Indian Notes and Monogr. Mus. Amer. Indian, Heye Foundation, vol. 2, pp. 394–396, 1921.

Santo Domingo, is also typical of Jamaican figurines. There are no incised lines in Jamaican ware with terminal pits, as in the Porto Rican-Santo Domingan pottery area. Painted ware likewise is lacking, the vessels in the National Museum collection having a burnished yellow surface color.

In Jamaica, according to Joyce and Duerden, the most characteristic vessel is a boat-shaped round-bottomed bowl, the ends elongated to form handles and sometimes decorated with incised patterns. Circular shallow bowls with the edges turned inward at a distinct angle and the lip strengthened by an additional band of clay are typical. Incised designs are often found round the edges, as well as applied ornament. Occasionally an indented rim occurs; and handles often degenerating into mere knobs are common, as in the mortuary vessels. (Pls. 40, 41.) Such knobs are of a type characteristic of the island. In Jamaican pottery the most elaborate form of ornament is usually found upon the zoomorphic handle designs. These sometimes take the form of mammal or bird (parrot?) heads, as in Santo Domingo. In form, however, the similarity leans toward Cuban aboriginal earthenware.

Prehistoric earthenware of the Virgin Islands.—Some examples of prehistoric earthenware of the Virgin Islands in the Museum of the American Indian, Heye Foundation, are of a fine yellowish ware with very thin walls like the Jamaican cave ware from near Kingston. Most of the vessels, however, are of a coarse terra cotta or biscuit ware with a bright crimson slip. Geometric designs in white or yellowish paint, also incised decorations exist. Shallow trencher-shaped bowls with raised ends covered with a crimson slip have figurine heads of the frog and conventionalized turtle forms appearing as handle lugs.

Pottery vessels from St. Thomas and St. Croix may be segregated into two classes—those having painted decoration and those having none. Generally speaking, the plain pottery from the two islands, also that from Barbados, are the crudest types found in the Antilles. The elaborate incised and impressed decorations so common to the vessels from the Greater Antilles are entirely lacking here.

The boat-shaped vessel occurs as in practically every island of the Caribbean. Another simple and not uncommon terra cotta ware bowl type, the cazuela, has a flattish base, slightly incurved rim, and hemispherical body. Small, shallow, rounded bowls with plain rims with two handlelike projections from the upright rims are common also to the Virgin Islands. They are of a well-fired, light-brown clay. Platters with slight concavity are common to St. Croix, St. Thomas, and Santo Domingo. Globular bowls with bilaterally placed loop handles are known from Magens Bay, St. Thomas, and

resemble examples from Porto Rico and Santo Domingo, while 2-compartment vessels occur resembling the red-ware bowl from Samana. Incised and impressed ornamentations are rare in the Virgin Islands, and when executed the patterns are simple. Walls are thicker than in similar vessels from Porto Rico and Santo Domingo. Some of the vessels have a red slip on the outer walls and extending over the rim on the inside. Similar vessels have sometimes more elaborate decoration of painted scrolls in red facing one another in the inside of the bowl, resembling incised recurved volutes from the Bahamas.

In the representative archeological collection of Mr. F. Andersen, Kingshill, St. Croix, Virgin Islands, are many fragmentary and whole pieces of aboriginal ceramics resembling in the main the earthenware of Santo Domingo in form and in design. Mr. Andersen carefully excavated a midden on the bank of a stream in the center of the island of St. Croix. The clay bank yielded cultural deposits to the depth of 6 feet; elsewhere, the midden deposits in St. Croix rarely exceed 2 feet in depth.

The St. Croix earthenware consists of figurine heads, sections of bowls and of water bottles or of vases resembling the Santo Domingan water bottle minus the figurine head embellishment on the lower neck sector. Several large bowls were recovered intact or but slightly broken about the lip. None of these vessels have figurine heads in conjunction with loop handles. Figurine heads are apparently luted onto the sides of vessels in the same manner as in Porto Rico and Santo Domingo, and show the same variety of animal forms. Inward-gazing, or outward-gazing figurines, with high-standing headdress or hair tuft, and prominently protruding snout and nostril holes, as represented in this St. Croix collection, are typical of Lesser Antillean forms. On the other hand, eye and ear forms, the former shaped by incising two concentric circles and the latter by an accentuated double-lobed ear, resemble Tainan ear forms of Santo Domingo. Certain depressed head forms, whose profile resembles a series of concentric crescents in relief, also resemble Tainan technic from Santo Domingo. The upraised snout with prominent nostrils is decidedly non-Tainan but characteristic of the Lesser Antilles. Bowls belong apparently to two wares, one of which is massive in form with thick walls but covered on the incurved outer surface above the shoulder with characteristic Tainan incised patterns in circles, rectangles, straight and curved lines. These are, however, no less associated with terminal punctations. Wens and knobs crowned with concentrically incised circles are common to this ware. Some of the bowls are plain surfaced. Shapes are hemispherical or flattened globular, having strongly incurved rim; other

forms have upright rims. The second class of bowls consists of trencher or boat-shaped vessels having a markedly incurved rim surmounted with vertically placed figurine heads placed at opposite ends and reaching above the level of the rim. Walls of the boat-shaped vessels are thinner than of the thick-walled plain ware which is minus figurine heads.

Prehistoric pottery of the Lesser Antilles.—Though prehistoric pottery of this area is technically and artistically superior in several respects to that of the Greater Antilles, the question as to its origin remains unsolved. Slip decoration is not uncommon, the paste is often more homogeneous, footed vases occur with greater frequency, and the vessel generally shows a superior finish.

Pottery and basket making as now practiced by the natives of several of the Lesser Antilles are descendants of the Indian arts and often Indian names are retained by the potters. Prehistoric forms and decorations have likewise been preserved by the modern potter. This, according to Fewkes, is noticeably the case at Nevis. Prevailing painted colors are red and white, sometimes brown. (Pl. 44.) Decorations are generally incised or in high relief. The so-called modern "monkey" goblet, or vase with tubular snout appended to one side, is a good example of a form derived from an aboriginal pattern from Barbados and St. Kitts. (See Santo Domingan form, pl. 54.) Human faces, heads of birds and reptiles, especially the turtle, are favorite life motives on handles and effigy vases from the Lesser Antilles.

St. Kitts pottery vessels are ring grooved; rims are strongly reinforced and outcurved. (Pl. 45.) The pottery from this island is red and white with incised decoration resembling pottery from the St. Vincent-Grenada area. Throughout the Lesser Antilles, figurine heads characteristic of the island are found. Clay buttons transfixed with a slit or central punctation are frequently used to represent eyes, nose, ears, mouth, but supernumerary knobs on the forehead are not as numerous in Santo Domingo as in Grenada and St. Kitts, though a few typical forms are found in Santo Domingo. (Pl. 13.)

Handles of both the knobbed and figurine head types are larger or rather extend farther beyond the rim of the vessel than in Santo Domingan forms. Flaring pedestal bases; angular walls with distinct shoulder; thick-walled, grave vessels with tapered conical walls as in certain Virgin Island forms, are characteristic of St. Kitts Island, as is also painted ware.

Carriacou earthenware through presence of following elements of form and design is dissimilar to Santo Domingan earthenware vessels: Flaring annular bases; thumb-nail or finger impressions

forming encircling bands around the margin; holes punched into the rim from above, forming an encircling band of punctations; snout in form of spout as in the single existing examples of turtle effigy bowl from Andres, Santo Domingo. (Pl. 54.) Similar forms occur in St. Kitts and Nevis.

Pottery from Grenada is allied with Trinidad wares. It is likewise similar to that from St. Vincent and Carriacou, although no complete bowl from Carriacou or Grenada exists in the Museum collections. Massive figurine heads show bold scrolled lines, bloated faces, massive ridges for eyebrows, bulbous nose with nostrils, deep, nucleated circles, perforated at center, each representing mouth, eyes, etc. These details of design, also the red color with white interstices or lines filled with white color, mark Grenada ware as distinct from Santo Domingan forms. Upturned snouts of zoomorphic forms resemble those from Andres and from Constanza, Santo Domingo. (Pl. 19.) Effigy jars from Grenada with massive head forms taking up the entire neck or oral region resemble large effigy jars from Puerto Plata in the Dominican National Museum. (Pl. 9.) Handles appear at end of small boat-shaped vessels. St. Vincent disk stamps with short handles like Andres examples have incised patterns in geometric form. Pottery from St. Kitts includes vases, bowls, and platters, red in color, fine superficial polish, decorated with incised lines filled in with a white pigment. Differs somewhat from Porto Rican ware in texture, color, and in forms, specifically in the thicker walls, spare use of incised lines which are deeper and more curvilinear or scrolled, showing the isolated use of large circular incisions on the inside walls of the bowls. Tapering rim walls and other indications place this pottery rather with Trinidad forms, where paint rather than incised decoration prevails.

TRINIDAD AND SOUTH AMERICAN EARTHENWARE TYPES

Trinidad pottery, while closely allied to the South American Orinoco region generally, is dissimilar to Santo Domingan forms in the use of curved lines to set off a feature, usually a wen, knob, or flat disk in relief, also in the use of a flaring pedestal base. Among the earthenware vessels from Trinidad are several rectangular dishes with legs. Angularity of figurine head forms is characteristic of Trinidad ware. Upright circular disks on nose of figurine heads representing a species of bat are peculiar to Trinidad. Similarities in Trinidad and Santo Domingan ware are such details as transverse position of applied head as in Andres ware; bulbous nose, but not the discoidal enlargement just mentioned; head forms with faint lines indicating turban and ear forms; faint punctations for

eyes, circular flat disk with coffee bean slit or circular punctation representing the pupil; the bulbous nose and incised slit representing the mouth as in the red painted ware from Andres; knobbed extension of the handle lugs in the form of alligator head modelings—all these are similarities in prehistoric Trinidad and Santo Domingan wares.[39]

Dissimilarities may be seen in the long angular neck, bloated face form, angularity of figurine head, discoidal or flat relief features of Trinidad ware, and in the lack of concentric circles, depressed face, and deep pits surrounded with concentric rings resembling goggles as in Santo Domingan terra-cotta ware. Fewkes's studies of the pottery from a shell heap at Erin Bay, Trinidad, were made during the winter of 1912–13, while during the early months of 1915 De Booy excavated a midden deposit at Giri-Giri on Margarita Island, off the northern coast of Venezuela. Most of the pottery heads excavated by Fewkes at Erin Bay, Trinidad, are painted, while the Giri-Giri examples from Margarita Island show no painted decoration. Heads recovered by De Booy near Cape Mayaro, Trinidad, show resemblance to the Margarita specimens.

Fragments of vessels found by De Booy in the Giri-Giri midden were painted in red, white, and brown designs like the St. Kitts example figured in Plate 45. Other shards of similar type have been found on the Carib islands of Carriacou and St. Vincent, but are not found elsewhere in Trinidad, indicating that Carib middens are more common to St. Vincent and Carriacou than to Trinidad and Margarita Islands. The peculiar massiveness of earthenware vessels, particularly of a shallow bowl with broad angular rim and painted design in polychrome, also of the modeled clay heads with their bloated appearance, as contrasted with the more pinched expression of the Taino modelings from Santo Domingo; also the painted red, black, white, and polychrome designs from the Carib island of Montserrat—all these are characteristic of so-called Carib designs and forms. The red, also the red and white painted heads; also the red painted heads and the polychrome geometric designs from southwest Porto Rico, although coming from Tainan territory are similar to Carib decorative embellishments from the Lesser Antilles. As a rule the rims of the earthenware vessels from Santo Domingo have approximately the same thickness as walls of the vessels themselves, whereas in Trinidad they are often enlarged, or turned back as in the thick-walled St. Kitts pottery (pl. 45), and are commonly ornamented with figures on the inside as is the pottery from Grenada and St. Vincent. (See pl. 36 for similar Constanza example.)

[39] Fewkes, J. Walter, A Prehistoric Island Culture Area of America, Thirty-fourth Ann. Rept. Bur. Amer. Ethn. (1912–13), pp. 49–271, 1922.

The nearest point in South America where excavations of shell heaps have been made is the Pomeroon district, British Guiana, whence we have a few specimens of pottery. Regarding the Pomeroon shell heaps, Im Thurn reached the following conclusions:

> (1) That they were not made by resident inhabitants of the country, but by strangers; (2) that these strangers came from the sea, and not from farther inland; and, (3) that these strangers were certain island Caribs, who afterwards took tribal form in Guiana as the so-called Caribisi, or, as I have called them, true Caribs.[40]

The nearest South American people to whom we would look for a kindred tribe to the Arawak are the Guaranos, or Warrau, who still inhabit the delta of the Orinoco, only a few miles across the Gulf of Paria. Joyce [41] points out the resemblance of some of the heads of Trinidad prehistoric pottery from Erin, Trinidad, to that which occurs "throughout the basins of the Aruka and Araau tributaries of the Barima River, not far from Morowhanna. The Aruka hills, isolated eminences stand now in a tidal mangrove swamp, and were evidently at no very distant date actual islands."

Many of the clay heads figured by J. B. P. Josselin de Jong [42] from the Dutch Leeward Islands of Aruba, and Curacao off the Parian coast of Venezuela are identical with clay figurine heads from Santo Domingo. Concentric eye rings; projecting snout region; inward peering faces; also low annular feet such as occur in the Lesser Antilles. White paint on the body of earthenware vessels, as in Trinidad, Monte Cristi, and Cuba, shows an identity too general to be of importance for purposes of comparison. The globular water bottle with clay head luted to the lower neck occurs in a find from Aruba, resembling finds in Peru, in the Colombian uplands, and in Santo Domingo.

Fragments of vessels from these islands of the Dutch Leeward group, except urns and the coarser pottery, are well burnished and painted. Painted designs consist of black or brown lines on blue, red, or white background, and white or yellow lines on a black background. Pictographic designs of plants, animals, or men are not found. Relief figures, with incised straight and curved lines, include representations of human faces, and of frogs and frogs' heads. Handles are fastened to the rim as knobs, faces, and loops. Sometimes a second handle lower down is added to the one mentioned. Some painted vessels are also provided with spouts, as in southeastern Santo Domingo. The paste is coarser in the undecorated than in the decorated vessels. Tempering materials consist of sand, coarsely powdered shell, and pulverized granite. Fre-

[40] Im Thurn, E. F., Among the Indians of Guiana. London, 1883.
[41] Joyce, T. A., Central American and West Indian Archaeology, p. 254. London, 1916.
[42] The Pre-Columbian and Early Post-Columbian Aboriginal Population of Aruba, Curacao, and Bonaire, Int. Archiv f. Ethnog., Bd. 24, Heft 3–4, 1918.

quently only the surface has been discolored by firing, so that the natural color of the gray clay remains.

Funeral urns have decorations on both inner and outer wall surface (compare Constanza fragment, pl. 36). Lids and pedestal bases are common elements of form. Rim fragments show three kinds of vessels: Wide-mouthed pots or bowls with outcurved rims; narrow-mouthed bottles with outcurved rims; shallow bowls without necks and with hollow rims. The first type is common.

The large mortuary jars or urns offer little that might be offered as evidence of contact with aboriginal pottery form and design of Santo Domingo. Small earthenware vessels from Aruba show resemblances in the incurved rim occurring on shallow hemispherical flattened bowls, and in the transversely incised bulbous rims. Tall, flaring annular bases, however, are not found in aboriginal Santo Domingan pottery, as in that of Aruba.

Earthenware fragments showing painted line designs are not duplicated in Santo Domingan middens, although rim fragments showing additional rim coils luted on the outer lip occur in Santo Domingan middens in quantity. Figurine heads have eye representations of the pitted, also of the applied, incised coffee-bean types, in the form of protuberances or clay buttons, pierced or incised lengthwise and encircled with an incised circle. Nose forms appear with or without nostril pits; bat and owl shaped figurine heads are frequent; frog designs in series range from the realistic to the conventional as in Santo Domingo. Clay ribbons flank molded figurine heads; handle loop and figurine head are combined, and the use of incised lines and pits in conjunction with knobs, wens, bosses, and buttons betrays a close relationship with plastic pottery decorative design from Santo Domingo, which the painted embellishments would seem to belie. Hollow clay heads, stamps, and other of the elements of plastic design referred to as practically identical with Santo Domingan decorative forms are figured by De Jong. Such characteristically Tainan design elements, however, as the broken incised line terminated with the pit incision, is lacking from Aruba, but encircling bands of punctations, indentations, and corrugations appear in both areas. Handle loops without other decorative embellishments, hollow knobs, pits with raised bands of clay encircling them, foot representations with incisions marking toe forms—all these are similar elements of form and decorative design. Hollow rims, however, do not occur in Santo Domingo.

Several earthenware grave finds from the Atlantic coast of Darien, on the Gulf of Uraba, at La Gloria, are described by S. Linné in Darien in the Past.[43] These examples of ancient Panaman ceramics

[43] Linné, S., Darien in the Past. Goteborg, 1929.

are burial urns of simple form and of comparatively small size. They are not provided with lids as are the earthenware vessels fashioned by the modern Cuna Indians of Darien.[44] They rest on an annular foot which is connected with the body of the urn by free supports. These are of archeological interest for our study because of their incised and applied decorative motives. A decorated zone consisting of diagonally incised lines forming series of angular designs encircles the well-defined oral section. Filling in the angles between the diagonal lines are several flat-bottomed punctations. These incised lines and punctations resemble similar decorative zones appearing on the incurved walls above the shoulder ridge of earthenware vessels from Santo Domingo and from the Gulf coast of the Southeastern States.

Applied embellishments appearing on the La Gloria burial urns consist of four modeled frog figurines luted on the incurved walls of the body of the vessel. Holmes figures the frog design on earthenware from Tennessee. (Holmes, fig. 66.) The frog figurine also is a frequent motive on earthenware vessels from the Greater Antilles. In South America it has been mentioned as occurring in northern Argentina (Ambrosetti, fig. 135), also in Brazil, from Counany, on the coast north of the mouth of the Amazon River (Goeldi, pl. 2). In Peru similar frog figurines are figured by Seler and Tello. In Colombia the frog figurine on earthenware vessels is frequently found in the highlands. (Uhle, pls. 3 and 4.)

An interesting correlation to the comparative absence of Mexican influence in the Greater Antilles lies in the distribution of vessels with clay lids. The Andean and Mexican areas are the exclusive centers for lidded clay vessels, although earthenware stoppers for narrow-necked vessels are known from Panama, Guiana, Venezuela, and from Marajo at the mouth of the Amazon River. Lids to clay vessels are reported from Atures on the Orinoco River.

At several sites in the valley of the Amazon appear old shards from middens and from graves having inward-gazing figurine heads. There is, however, always some contributing factor to set the design and form as apart from what has come to be known as established Tainan forms and designs from the Greater Antilles. The Manabi Equadorian long slit eye modeling is less characteristic than the more rounded excavation characteristic of Santo Domingan eye forms. The snake design occurs in the Amazon Valley in punctated but not in nodal form. Both types appear as embellishments of Santo Domingan pottery.

[44] Krieger, H. W. Material Culture of the People of Southeastern Panama. Bull. 134, U. S. Nat. Mus., 1926.

In the valley of the Orinoco we have scant material for comparison with Santo Domingan earthenware types. Spinden[45] mentions that painted wares do not occur at Lake Tacarigua. Punctated eye designs, representations of nostrils, also obliquely set, long-slit eye forms appear. Eyebrows and nose are in relief; indications of a feather headdress, two or three forms of excrescences at the top of the heads, effigy vessels with a horseshoe-shaped figure in relief opposite the head and representing the tail—all these from several sites and selected from several collections are duplicated in Santo Domingan design.

In the Andean region painted pottery is common, but elsewhere it is rare. In caves and near sacred lakes on the wind-swept paramo many interesting figurines of men and women have been discovered, the former seated on stools (see pl. 17) and the latter in a variety of standing and sitting poses. These are seemingly the idols of a primitive agricultural people. By the peculiar style of construction and decoration of these figurines the student of ancient art can clearly demonstrate a cultural bond between Venezuela and Central America. Breast ornaments of shell and serpentine, carved to represent highly conventionalized bats, are common in the Andean Province but become rarer as one passes toward central Venezuela.

The shores and islands of Lake Valencia are rich in archeological remains. The level of this body of water has fallen about 20 feet since the coming of the Spaniards, leaving old shore villages high and dry and making possible stratigraphic studies. Irregular earthen mounds containing a wealth of material, broken and entire, are found at a number of sites. Unfortunately for science, the most remarkable group of mounds is now being destroyed in a hasty and unguided search for specimens. In this region collars of carved beads are often unearthed as well as stone pendants in the form of frogs. Pottery is decorated by modeled designs, among which the highly conventionalized bat with outstretched wings is prominent. Figurines that represent human beings, jaguars, frogs, etc., are common and often finely executed.

Spinden's archaic culture in pottery forms includes not only specialized eye modelings, headdress forms, etc., but also lugs, handles, tripod base, paint, etc. To the postarchaic must then be assigned only those designs and forms showing special developments due to local fauna, religious inspiration as divinities, etc., and food practices. Archaic developments in South America are still in question. Even Max Uhle's finds, undoubtedly similar to the Mexican archaic, do not establish prima facie evidence of cultural diffusion between the early Mexican and Peruvian forms.[46] Ceramics of the Colombian highlands had reached a high development in form and design. Stamped ornaments and figurines replaced the free-hand modeled archaic figurines, if such they were. Chibcha ceramics with its frogs

[45] Spinden, Herbert J., New Data on the Archeology of Venezuela, Proc. Nat. Acad. Sci., vol. 2, pp. 325–328, June 15, 1916.

[46] Die Muschelhügel von Ancon, Peru, Eighteenth Int. Congr. Americanists, London (1912), 1913.

peering over the lip of vessels might also appear as a development direct from the archaic. Elsewhere in the valley of the Cauca as far north as Chiriqui one finds modelings of similar designs.

Chibchan [47] high annular pedestal bases and polychrome painted designs are strong differentiations from the archaic associated with religious ceremonial wares.

In seeking to establish influences such as these within the lowlands of northeastern South America we must also seek to find local developments such as arose within the lowland area independent of Andean influence.

We might let pass as South American forms of the archaic art, crude wares with incised instead of painted design. Spinden finds that globular bowls with constricted neck, not a true oral sector but provided with lugs, handles, or with inward-gazing modeled figurine heads, may pass as South American representatives of the archaic.[48] One is, of course, privileged to find fault with such a sweeping generalization as being meaningless.

Aboriginal pottery was diffused in the archaic stages of its development throughout lowland South America and the West Indies. Definite chronological or even form sequences are as yet undeterminable. It is remarkable, however, that Santo Domingan ceramics, even though archaic in form and certain details of design, still are suborned under religious ornamental forms peculiarly Tainan in style. South American divinities, also archaic figurine forms as known from the valley of Mexico, do not occur in the Greater Antilles.

The finds from Ancon, Peru, among other forms include a clay head with concentric rings incised to represent the eye. Other eye forms are simply made through punctations. Both eye forms occur in Santo Domingo. Nordenskiöld excavated clay heads with concentric eye rings in the valley of San Francisco in the Argentine.

In the delta of the Parana prehistoric pottery has painted monochrome banded, also incised ornamental designs. Nordenskiöld discovered at Chimay, on the upper Rio Beni, shards on which figurine heads had obliquely set eye forms resembling clay heads from Trinidad, Grenada, Porto Rico,[49] Vieques, and Santo Domingo. (Pl. 16.)

Arawak intercourse with Yucatan was probably limited to indirect trading through South American tribes. Maya influence appears to be nonexistent in native Cuba, Santo Domingo, and Porto Rico, but present in small degree in Jamaica. Central American influence

[47] Restrepo, Vicente, Los Chibchas, Atlas Arq., Lam. 26, pp. 79–81.

[48] Spinden, Herbert J., Ancient Civilizations of Mexico and Central America, Handbook, ser. No. 3, Amer. Mus. Nat. Hist., p. 53, 1917.

[49] De Hostos, Adolfo, Prehistoric Porto Rican Ceramics, Amer. Anthrop., n. s., vol. 21, fig. 4, 1919.

generally was felt in the West Indies principally through native agricultural practices. Maize, cotton, and perhaps other crops cultivated in Santo Domingo were first introduced from Mexico through the Maya traders.

Stone collars somewhat analogous within both Maya and Arawak areas, stools of stone with sculptured figurines depicting life forms, the axially drilled tubular stone bead, weaving of cotton cloth, the molding of clay figures in anthropomorphic and zoomorphic forms—all these features of analogous design within both areas indicate a close cultural influence from Mexico and Central America entirely distinct from a more direct influence from the Maya of Yucatan, which apparently did not occur among the southern United States tribes occupying the wide expanse of territory bordering the Gulf on the north.

Samuel K. Lothrop [50] writes that it is his belief that Antillean "culture" had a distinct connection with southern Central America. This belief is founded upon the fact that the red-line ware patterns and also some of the small modeled figures in stone cist ware of Costa Rica have a distinct Antillean flavor. In addition, pictographs from the two regions are surprisingly alike, while the chairs of the present tribes in South America resemble those of the Guetar (Costa Rica). For geographical reasons direct contact between these areas was impossible and those features which are common to both were doubtless passed along by the natives of Colombia.

Connection with the Andean region is evident in pottery shapes as well as in the styles of decoration. A development over a long period of time doubtless took place here with a succession of somewhat different types.

It would seem that throughout the whole of tropical lowland northern South America development in pottery manufacture among aboriginal tribes proceeded along somewhat analogous lines. This, so far as pertains to design, included the transition from incised and plastic designs to painted forms of great variety, including effigy vessels replacing effigy forms in miniature which have come to be considered as characteristic of the archaic earthenware, but at a later date were luted on to the walls of vessels as handle lugs. In a thorough discussion of modern pottery of the Guiana Indians.[51] Roth notes transitions from prehistoric to modern forms and designs that correspond to the observation just made. Modern pottery of the Surinam Carib is painted and covered with a glazelike surface finish on which appear geometric line paintings in black on a purple background. Effigy figurines, either in black or in purple, with black line

[50] Pottery of Costa Rica and Nicaragua, Contr. Mus. Amer. Indian, Heye Foundation, vol. 8 (2), p. 410, 1926.

[51] Roth, Walter E., An Introductory Study of the Arts, Crafts, and Customs of the Guiana Indians, Thirty-eighth Ann. Rept. Bur. Amer. Ethn., p. 130, 1924.

designs forming V-shape figures, scrolls, and frets, are but an elaboration of what Roth terms old-time transitional forms of pottery from the Brazilian-Guiana coast with its bold painted scrolled designs painted over the entire surface of the vase or bowl. This same type of vessel form, and of painted decorative design, also appears in the pottery from the island of Marajo, in the delta of the Amazon River. Applied embellishments are rare, a few knobbed conventionalized extensions on vessels resembling the Jamaican boat-shaped funerary pottery, and that is all.

In Plate 27 Roth illustrates forms and designs of the Brazilian Guiana coast ware with its tall wide mouth and straight rim, resting on a friezed extension of the constricted neck. In plate 28 Roth (after Goeldi) shows additional transitional forms from the Brazilian-Guiana coast ware representing effigy vessels of a modified cylindrical form. Flat trays of the same ware show along with the scrolled painted decorative designs a number of figurine heads placed at the ends of rectangular vessels. These zoomorphic figurine heads betray a certain resemblance to those of the Lesser Antilles. Their comparatively rare appearance indicates a receding use of plastic decorative embellishments of this sort. Wide-mouthed jars with fretted and other angular designs painted over the entire outer surface resemble in form if not in design the 2-decked forms of the double bowl from Santo Domingo where a frieze resembling a superimposed bowl rests on the neck of the bowl beneath. This later form is in the museum of Georgetown. It is in what Roth calls the old-time pottery that the resemblance to prehistoric Santo Domingan form and design begins to approach identity.

The ancient Indians of Pacoval, on the island of Marajo in the delta of the Amazon River, tempered the clay used in making their earthenware with potsherds. In the walls of fractured vessels large fragments still showing their painted surfaces have been found.

In modern South American Indian pottery the ashes of the bark of several trees are employed for tempering. In Guiana the bark used is that of the Couepi tree (*Couepia guianensis*).

In Amazonian pottery ornaments are rarely impressed or stamped. Circles are made with the end of a hollow stick. The Chambioás and Carajás of the Araguaya make wooden dies with which to ornament their pottery, the Carajás using a sort of Maltese cross.

The surface of the vessel, after having been smoothed down, is often washed with a thin layer of pure, creamy clay, which appears to be sometimes burnished before firing, producing a beautiful, hard, and almost polished surface. The common ware of the civilized Indians of the Province of Para is usually very plain and rarely ever painted, but that of the Upper Amazon is often beautifully ornamented in several colors, with frets and borders, and

other purely aesthetic forms, the absence of all attempt at representations of plant forms being remarkable. The black color is made of the juice of mandioca.

The ancient pottery of Pacoval is often adorned with frets and scroll borders and other ornaments, drawn on a white ground with marvelous accuracy.

Ornaments are sometimes scratched with a sharp point on the surface of modern Amazonian pottery, and, occasionally, ornaments are made consisting of a series of holes. The etching on the prehistoric Pacoval pottery is exceedingly delicate. Sometimes the same pottery is decorated by first washing the surface with white clay and then engraving so as to leave an ornament in relief. The instrument used seems to have been a tooth of a paca or some other rodent. Some of the large burial vases are covered with ornaments of this kind, which must have required long and patient labor.

A pottery stamp now in the Georgetown Museum from the Grenadines resembles one illustrated by Fewkes from Trinidad. In general, the effigy vessels of the Georgetown Museum collection, called old-time objects by Roth, are departures from Antillean forms as represented in Santo Domingan collections, in that they stand on 4-legged bases, or resemble somewhat the cylindrical effigy vessels from the Brazilian-Guiana coast belonging to the painted forms of the transitional period (see pl. 28, transitional, and pl. 31, old-time unpainted effigy vessel). The figurine heads, handles for the most part, but also images and rattles are identical with Santo Domingan forms.

There are traces of pottery similar to that of Pacoval Island in Lake Arary on the island of Marajo in the delta of the Amazon, according to Lange, on the Amazon River near Manaos, 850 miles upstream.[52] There are also said to be deposits on the Tapajos and Xingu Rivers. Caves are said to yield pottery in the forest region of upland Brazilian Guyana, but 100 miles from the Arary River, also on the upper Moju River 300 miles from Pacoval. There are apparently two types of pottery illustrated by Lange, one an older incised ware, the other a painted ware showing the same designs in part but taking on more of the character of a transitional type with the modern forms common to South American lowland tribes of to-day, such as are figured by Roth from British Guiana. The older incised forms show a pleasing use of knobs or rounded wens surrounded with incised circles in pairs; of frets and other rectangular geometric designs alternating with nucleated circles. Relationship with Antillean forms and designs is distinct, and the Marajo earthenware can not be shown as ancestral to Antillean types or wares except as it undoubtedly forms a part of one large

[52] Lange, Algot, The Lower Amazon, p. 339, New York, 1914.

pottery area occupying all of the lowland area of northern South America.

The greater number of the Arawaks of northern Brazil and southern British Guiana are found within a broad savanna some 20,000 or 30,000 square miles in extent, reaching from near the Venezuelan boundary to the western banks of the Essequibo River and from the Amazon forests to the foot of the Pakaraima Mountains; or from 58½° to 63° W. longitude and from 1½° to 4½° N. latitude. It is a great undulating plain dotted here and there with grass-covered, round-topped mountains, also three short ranges, forest clad in part—the Mocajahi, west of the Brancho River; the Moon; and the Kanuku. The latter forms a picturesque chain which continues eastward to the Corentine. There are several tribes belonging to the central Arawak peoples who claim relationship. These are the Atarois, who have been absorbed by the Wapisianas, recent invaders, who in 1738 occupied all the Brazilian savannas south of the Takutu and the Uraracuera Rivers. This group of Arawak, the largest of the central Arawak groups, was studied by W. C. Farabee,[53] who gives this account regarding their methods of pottery manufacture:

> The Wapisianas are not good potters, partially because there is no fine clay in the immediate region. The coiling process is used in manufacturing all kinds of pottery. The pot is built up by laying on of successive rolls or fillets of clay the size of one's finger. These are pressed down and made to adhere to the layers below, then smoothed on both sides by rubbing with a red jasper pebble and a piece of calabash. When completed the pot is allowed to dry in the shade, then burned in an open fire. A hole is dug, the vessel placed in it with the mouth down, and a fire made of bits of dried palm and softwood built over it. While the vessel is still hot, cassava juice is poured over it to fill the pores. Sometimes the clay is tempered with ashes. The cooking pots usually hold about 3 gallons, but the storage pots for drink may be three or four times as large. There are also smaller cooking pots for use when traveling.
>
> After the pot has been thoroughly fired it is allowed to cool before being painted. A black rock called "tcal" is pulverized and mixed with melted gum called "diakarieib." With this the designs are painted on and allowed to dry for a time, when the pot is again fired sufficiently to melt the gum. Another gum, "gumanime," is melted and run all over the pot. When it has cooled it is smoothed and polished by rubbing.
>
> Sometimes the groundwork is a red paint made of annato (*Bixa orellana*) mixed with the same gum and applied in the same way. When dry, black geometrical designs are painted on the vessel, after which it is fired again.
>
> A white slip made of feldspathic clay is often used before either the red or black designs are painted on, but not until after the first hard firing.

According to Farabee,[54] who studied the material culture of the Arawak tribes of the upper Amazon Valley, namely, the Machey-

[53] Farabee, William Curtis, The Central Arawaks, Univ. Penn. Anthrop. Pubs., vol. 9, p. 24, 1918.

[54] Farabee, W. C., Indian Tribes of Eastern Peru, vol. 10, Papers Peabody Mus. of Amer. Archeol. and Ethnol., Harvard Univ.

enga, the Campa, the Piro, and the Mashco, the pottery made by these tribes is inferior to that made by the Conebo, who belong to the Panoan stock. Several of the Arawak tribes obtain their best pottery from the Conebo in exchange, while others, as the Mashko, make good pottery. "The Conebo women are the best potters in the whole Amazon Valley, but they are followed very closely by their Sipibo neighbors. The pottery made by these two tribes is supplied by exchange to many other tribes throughout the Ucayali River and its tributaries. The Conebo make more pottery, and hence their name is attached to all the pottery of the two tribes."

The materials are all obtained locally. The white clay is collected from the river banks at low water, and the pottery, on this account, is made during the dry season. The ash or bark of the ohe tree (*Licania utilis*), or of some other tree giving a very fine white ash, is mixed with clay in an old pot where it can be kept clean. When the clay, mixed with water, has reached the desired consistency, a small lump is rolled between the hands or on a board into a long fillet, the size depending upon the thickness of the pot. This is then placed around the edge of the pot under construction, squeezed into place by the fingers, and smoothed by holding a stone on the inside, and rubbing with a shell on the outside. Thus the worker goes around and around the pot, until it is completed. No wheel is known; the pot sits in the sand or on a board. The necks of the smaller pots are made separately and luted on.

The small drinking bowls are made exceedingly thin and in perfect form. The rim is trimmed with the teeth, moistened with the tongue, and finished with the thumb nail. When the pot is finished it is allowed to stand in the shade until it has hardened, then it is smoothed and polished. If it is a cooking pot, it is fired at once; if it is to be painted, a thin slip of very fine white clay is first applied, and when dry the decoration is laid on with a strip of bamboo. Yellow clay is used for yellow slip and red stone for red slip. The large rough pots are placed in a slow open fire and thoroughly burned. The large puberty pots are burned by placing them upside down on a tripod of three smaller pots and covering them with a great heap of dry, thorny bamboo, then a fire is built underneath and fed with the same material. By this method very little smoke is produced and the intensity of the heat can be controlled. The fine drinking bowls are treated very differently. A large pot with a hole in the bottom is placed on three stones, or more often three piles of inverted pots and the bowls to be fired are inverted inside the large pot. The first one is placed over the hole and ashes poured around and over it, and others are inverted over this until the pot is full or all are used. A slow fire is kept burning under the large pot until all are well baked, then they are taken

out one at a time and hot melted copal is poured over them. This accounts for the glazed appearance characteristic of this pottery.

"The various designs used in the decoration of the pottery must have had some symbolic significance in the beginning, but at present no one seems to know the symbolism. They say they have always used these forms. Similar designs are used in making their bead necklaces, in painting their cushmas, and in decorating their paddles, tobacco pipes, etc." In form, surface, finish, and decorative embellishment the wares of the Conebo, the upper and the Central Arawak tribes, differ from Antillean forms. The Conebo bowls and vases resemble in their shape and after a manner in their geometric painted designs the vases of the Pueblo potter rather than the incised wares of the Antillean and eastern United States aboriginal potter. The undecorated pottery bowls of the Mapidan Central Arawak are not characterized by peculiarities in form or design sufficient to differentiate the ware from any other undecorated South American aboriginal ware, let alone any comparison with West Indian prehistoric forms and designs.

CONCLUSION

A working classification of culture sequence in earthenware might be worked out for the entire pottery-producing area of America. If this were done, one would give primary importance to known chronological sequence in those limited areas where such sequence has been discovered. This would apply to Yucatan, to the valley of Mexico, and to the States of Arizona and New Mexico. Not enough is known of the time element in South America and of stratigraphy in the West Indies or in eastern United States to even approach the problem of culture sequence in earthenware types from the angle of chronology. Archaic earthenware forms and elements of decorative design throughout northern South America, the related wares in the southeastern United States and in the West Indies, persisting up to the period of European exploitation of the Americas, might be chronologically oriented if a midden or burial place of sufficient magnitude with definite stratigraphy indicated could be studied and the gradual replacement of the archaic forms with later wares of local origin such as the painted wares of the Lesser Antilles, of the Venezuela-Guiana region, or of the Pearl Islands-Panama area might be determined. Such study has not yet been made. The difficulty lies partly in the exuberance of development of pottery types in the several areas and subareas under comparison. In each of these wares several factors must first be solved before a time and culture sequence may be arrived at. For many of the subareas an independent origin for several developments in pottery form and design might be cited; for example, the cylindrical foot, the tripod vase and free

supports, the earthenware stamp, lids, complex incised patterns in decorative design, effigy, human, zoomorphic and aviform figurines, decorated water bottles, and above all, the multitude of painted designs, many of which are directly connected with tribal mythologies and religious motives.

In summing up resemblances and differences existing in the aboriginal pottery of the Gulf States and Santo Domingo we must first of all exclude as divergent types and as local, divergent wares many of the examples from the higher centers of pottery production, as at Moundville and Weeden Island; and Tennesseean and Arkansan effigy forms, which incorporate conventionalized designs based on local life forms and religious motivation impossible to correlate. Resemblances are rather with the less developed forms and designs occurring often far removed from the West Indian Archipelago. Thus, the Pawnee, the Iroquois, the Mandan, and the Choctaw, like the Cuna and the prehistoric population of Panama, share with the Taino of Santo Domingo and the prehistoric Arawak of South America truly marginal cultures in ceramics. Centers of intensive pottery production in the Central American, South American, West Indian, and Gulf States did not become centers of pottery diffusion so far as pertains to the more specialized painted or cult forms. We must, however, not overlook the fact that even marginal cultures bear in themselves the elements of development in ceramic form and design. Mention here need be made only of the unique Santo Domingan water bottle and of the modeled earthenware examples of local Antillean fauna. The use of slips and paints, like the shaping of divergent forms, was taking its beginning in southeastern Santo Domingo at the time of the discovery and conquest.

Pottery of eastern United States and contiguous eastern Canada had an origin in the Colombian and northern Andean pottery area in common with the Antillean pottery area. The several subcenters cited of intensive development in the potter's art show conversely a wide divergence in conventionalized decorative art, also in the elements of form. The marginal subareas showing a relatively slight development in pottery production retained elementary forms and devices for decorative embellishment. Here the forms are fewer and vary less from what we might designate as normal elementary types of bowl, vase, or container; decoration is less artistic and effected through incising and free-hand modeling. In western Porto Rico and eastern Santo Domingo conventional art and a rich mythology were leading up to a high differentiation in form, also in painted design. The gods of a primitive religion become personified in clay images. At this point Tainan art of the Santo Domingan-Antillean island culture area becomes distinctive.

INDEX

	Page
ABBOTT, W. L.—	
acknowledgment to	38
biological investigations made by	38
mention of	15, 35, 80, 93
work of	27, 42
AFRICAN DECORATION, similar to Santo Domingan	56, 70
AGRICULTURE, references to	1, 2, 63
AITKEN, ROBERT T., work of	26
ALABAMA POTTERY, compared with Santo Domingan	120
ALBERTI, NARCISO, work of	26, 40
AMAZON RIVER—	
mention of pottery from	94–95
pottery from, described	134–135
AMAZON VALLEY, figurine heads from	130
AMERICAN MUSEUM OF NATURAL HISTORY, mention of	6
ANACOANA—	
death of	2
gifts from	5
province governed by	18
ANADEL, village site at, explored	32, 74
ANDEAN REGION—	
Antillean connections with	133
pottery of	131
ANDERSEN, F., archeological work of	124
ANDRES—	
aboriginal village site at	38, 39
knobbed pottery from	67
mention of village of	6
pottery from cemetery at	6, 7
pottery from, described	97–104
ANIMAL LIFE FORMS, as decorative motivation	118
ANIMALS, represented by figurines	58
ANTILLEAN CULTURE, connection of, with southern Central America	133
ANTILLES. *See* GREATER ANTILLES; LESSER ANTILLES.	
ARAWAK INDIANS—	
an agricultural people	2
cemetery of	6
connection of, with Florida tribes	105
Cuban, migrations of	105
culture bearers in South America	3
grouped in provinces	16
habitat of	136
population preceding	20–22
Samana, origin story of	2
Santo Domingo, culture of	2
territory occupied by	12
ARAWAK LANGUAGE, spoken in Cuba	4
ARAWAK POTTERY—	
characteristics of	3, 51
compared with Carib	68–69
connection of, with that of Guiana	87
designs of, in North America	105
ARCHBISHOP MERIÑO COLLECTION, water bottles from, described	89
ARROWS. *See* BOW AND ARROW.	
ARTIFACTS—	
found in caves	28
from Ciguayan sites	32–33
from rock-cleft burials	32
Samana, period of	29
See also IMPLEMENTS.	
ASHANTI DECORATION, similar to Santo Domingan	56, 70
AZUA PROVINCE—	
field work in	38, 41–45
irrigation in	36
BACHILLER Y MORALES, ANTONIO, theory of	4
BAHAMAS, pottery of, discussed	120–121
BAINOA, irrigation in	36
BAITOA, mention of	42

54291—31——10

Ball game— Page
described by Herrera 38
described by Oviedo 47
Barter, articles of, among the islands 5
Behechio, cacique of Xaragua 18
Bellini, Padre, effigy owned by 87
Benzoni, Girolamo, record left by 23
Bird effigy, on Porto Rican pottery 73
Black ware, firing of 11
Boat-shaped vessels—
described 60, 97, 98–100
occurrence of 123
Boca Chica, Arawak cemetery near 6
Boca Chica Sugar Central, mention of 39
Boca del Infierno—
artifacts found in 28
use of, by expedition 27
Bonao, brief description of 42
Borinqueños, dances of 47
Bow and arrow, tribes possessing 16
Bowls—
described 97–104
from San Juan, described 76–77
two-compartment 66
without figurines 60
See also Food bowls.
Branch, mention of work of 24
Brinton, Daniel G., linguistic discovery made by 4
British Guiana, excavation of shell heaps in 128
British Museum, mention of pottery in 6
Brown, C. Barrington, stone circles described by 46
Burial grounds. *See* Cemetery.
Burial urns. *See* Urn burials.
Burials—
Antillean, described by Fewkes 41
at Boca Chica 39
flexed 40
in caves 22, 29
in Cuba and Porto Rico 29
in La Vega Province 29
rock-cleft 22, 32
Burials—Continued. Page
rock-ledge, pottery accompanying 7
under midden deposits 29
urn 32
See also Cemetery; Mortuary pottery.
Caciques—
duties of 16
early, fate of 2
household of 16
lives of, wrecked by Spaniards 2
preservation of corpse of 32
use of the term 16–17
Caizimu, Martyr's name for Higuey Province 19
Caloosa, a Florida chief 105
Canada, eastern, origin of pottery of 139
Canteens. *See* Water bottles.
Caonabo—
cacique of Maguana Province 17
death of 2
territory ruled by 17
Cape François, a French settlement 17
Carib-Arawak, culture of 3
Carib pottery—
characteristics of 127
compared with Arawak 68–69
Caribs—
as culture bearers 3
beliefs concerning, of Columbus 13
insular, origin of 4
linguistic affinities of 4
meaning of the name 5
territory occupied by 5
Carriacou pottery, elements of, unlike Santo Domingan 125–126
Carvings, pillar rock, in caves 21
Cassava—
culture of 3
griddles for baking 104
implements showing use of 38
utilization of, coincident with pottery 47
Catawba pottery, modern forms of 111
Cave burials 22, 29

Cave dwellers— Page
nonagricultural 20–22
unconfirmed 2
Cave of the swallows, excavations in 24
Caves—
characteristics of pottery from 75–76
culture deposits in 30–32
discussion of pottery from 6–7
explored by William Gabb 25
of Samana, pottery from 74–76
of Samana, remains found in 20
of Samana, work in 27–32
still occupied 29
use of, as burial places 22
use of, as places of worship 21, 22
use of, by the Arawak 21
Cayacoa, cacique of Higuey Province 19
Cazuela—
accompanying burials 7
Constanza type of 64
Cemetery, Arawak—
at Andres, extent of 40
at Boca Chica 39
pottery from 102–103
Censers, used by the Tule, described 95
Chane, steam cooker used by 94
Cherokee pottery, modern forms of 111
Chibcha ceramics, features of 131–132
Chiriguano, steam cooker used by 94
Cibao Valley—
agriculture in 18
described 15
Ciboneys—
culture of, traced in Cuba 21
Harrington quoted on pottery of 121
mention of 7
nonagricultural 21
subjugated by Arawak 21
theories regarding pottery of 118–119
Ciguayan Indians—
cultural identity of 37
error regarding, by Columbus 34
language of 19–20
reference to culture of 16
Ciguayan Indians—Continued. Page
territory occupied by 18
village sites of 32, 34
Circle of upright stones 46
Climate, affected by winds 13
Coiling, use of, in pottery making 61
Colombia, pottery of, similar to Santo Domingan 88
Coloring of pottery—
affected by iron 61
discussed 10–11
method of varying 50
unslipped paste 8
Columbus, Bartholomew, gifts to 18
Columbus, Christopher—
beliefs of, concerning Caribs 13
biography of, by his son 22
colony planted by 17
gifts to brother of 18
island named by 1
language noted by 4
mention of 38
records left by 22
slavery inaugurated by 2
varieties of pottery seen by 107
Columbus, Ferdinand, narrative written by 19
Colusa Indians, reference to 105
Compañía Azucarera Boca Chica, mention of 6
Conebo tribe, pottery of, described 137–138
Constanza, pottery found near 7
Constanza Valley—
described 43
natural mounds of 44
pottery from 100
type of pottery from 92–93
Construction of pottery 61–63
Cook, Wythe, work of 42
Coral, implements of 37
Cordillera Central region, described 41–43
Cordillera Septentrional, described 14
Corn—
use of, as motive in decorative design 107–108
See also Maize.
Corral de los Indios, described 24–25

	Page
Cotabanama—	
cacique of Higuey Province	19
death of	2
Cotton, production of	18
Crosshatching, use of, as decoration	54, 83
Cuba—	
pottery of, discussed	121–122
primitive language of	4
Yucatec influence in	4
Cueva de las Golondrinas, excavations in	24
Cueva de Roma, vase from	93
Cueva del Templo—	
Arawak vessel from	34
bowl from, described	76
excavations in	30
shards from	74
Culture, of the Arawak	2
Culture deposits, in caves	30–32
Culture migrations, in the West Indies	12
Culture relationship, of Antilles and Florida	105–106
Culture sequence in earthenware discussed	138
Cuna Indian site, potsherds from	72
Darien, pottery from coast of	129–130
Deangles, Señor, image owned by	88
De Booy, Theodoor—	
griddles mentioned by	104
investigations of	25
mention of	24, 50, 61, 65, 81
midden excavated by	127
pottery described by	94
Decoration—	
Ashanti, similar to Santo Domingan	56, 70
forms of	70
in Gonave Island	22–23
in punctate designs	53–54
of West Indian pottery	50
process of application	8–9
Santo Domingan, characteristics of	52
three forms of	54–55
West Indian, character of	57
zone of	57
See also Coiling; Coloring; Crosshatching; Design; Figurines; etc.	

	Page
De Jong, J. B. P. Josselin, mention of work of	81, 128, 129
Descent of Dominican population	1
Design—	
affected by culture level	56
applied decorative, range of	111–112
decorative, origin of features of	71
details of	61–63
elements of, discussed	71
geometrical, on Florida pottery	118
identity in origin of	57
local development of	57
pitted	82–83
range of	63
Disks, occurrence of	108
Dominican National Museum, pottery collection of	6
Dominican Republic, Topographic divisions of	14
Duerden—	
cited	123
mention of work of	24
Duncan, G. A., mention of	31
Dutch Leeward Islands of Aruba, pottery of	128–129
Dwellings, caves used as, by Arawak	21
Earthenware—	
classification of	72–74
comparison of	71–74
forms of	59, 70
grouped according to color	58
mention of, in early records	22
range of design area in	63
stamped, range of	82
surface finishes of	58
terra cotta, described	59
See also Pottery.	
Earthworks, mention of	43
Effigy bowls, unusual	60
Effigy canteens—	
described	90
distinctive form of	53
Effigy figurines, in Santo Domingo	69–70
Effigy vessels—	
described	62, 65, 87–88
lack of	9

Page

EKMAN, work of 42
ENVIRONMENT—
influence of, on pottery 57, 63–64, 118
negative influence of 14
ESKIMOS—
pottery of 49
ware of, mentioned 98
EXPLORERS, of West Indian sites 24
EYES—
modeling of 84
representation of, on pottery 54
FARABEE, W. C., quoted on Wapisiana pottery 136
FEET, ANNULAR, where found 72
FEWKES, J. WALTER—
archeological work of 26
mention of 20, 50, 77, 81, 87, 88, 95, 104
pottery studied by 6
publications of, on Santo Domingo 23–24
quoted on burials 41
quoted on handles 77
quoted on knobbed pottery 52
quoted on Weeden Island pottery 117
FIGURINE HEADS, modeling of 55
FIGURINES—
animals represented by 58
character of 50
conventionalized and realistic 62
place of 61
zoomorphic, unrecognizable 55, 85
See also HEADS.
FILTER JAR, found by De Booy 94
FIRING OF POTTERY 8, 11
FLORIDA INDIANS, connection of, with island Arawak 105
FLORIDA POTTERY—
compared with Antillean 88–89
compared with Santo Domingan 114–120
FONTANEDA, HERNANDO D'ESCALANTE, cited on Florida Indians 105
FOOD, of prehistoric cave dwellers 28

Page

FOOD BOWL—
double-compartment, described 78–79
oval, from Arawak cemetery 64
See also BOWLS.
FOOD POTS, described 52
FORM IN POTTERY—
discussion of 9
elements of, discussed 71
identity in origin of 57
local development of 57
FOX, MR., acknowledgment to 39
FRASER, figurine collected by 87
FROG FIGURINES, occurrence of 130
FUNERARY VESSELS. *See* MORTUARY POTTERY; CEMETERY; BURIALS.
GABB, WM. M.—
bowl collected by 89
reference to 33
researches of 25
GAMES. *See* BALL GAME.
GARCIA, ANTONIO M., archeological work of 44
GEORGETOWN MUSEUM, British Guiana, reference to 87
GILIJ, mention of work of 81
GIRI-GIRI MIDDEN, excavated by De Booy 127
GOACANAGARIC—
a cacique 4
death of 2
friendly to the Spanish 17
mention of 38
GONAVE ISLAND, noted for wood carving 18
GOURD-SHAPED VESSELS, DOUBLE, distribution of 61
GOVERNMENT—
Arawak 16–17
under the Spaniards 2
GOWER, CHARLOTTE D.—
quoted on Antillean pottery 116
reference to work of 106
GRAN ESTERO, closing of 15
GREATER ANTILLES, pottery of, compared with Lesser Antilles 68–69
GRENADA, pottery of 126
GRIDDLES, earthenware, described 59, 104

	Page
GUACCAIRIMA—	
cave dwellers of	20–21
territory included in	18
GUARICO, location of village of	17
GUARIONEX—	
cacique of the Vega	18
death of	2
mention of	20
GULF COAST WARE, compared with Santo Domingan	112–114
HAEBERLIN, H. K., mention of	26
HAIRDRESSING, Arawak	34
HAITI—	
meaning of the name	19
naming of island of	1
pottery of	5
HANDLES—	
general characteristics of	70
wide range of	61–62
HARRINGTON, M. R.—	
discoveries of, mentioned	21
griddles mentioned by	104
quoted on Ciboney pottery	121
quoted on culture contacts	119
reference to	20, 31, 81
statement by, on "Ciboney" culture	21
HATT, griddles mentioned by	104
HEAD DEFORMATION—	
mention of	29, 41
typical of Arawak culture	7, 29
HEADDRESSES, represented on figurine heads	55
HEADS, CLAY—	
described	84–85
general characteristics of	70–71
modeling of	55
See also FIGURINES.	
HIGUANAMA, ruler of Province of Higuey	19
HIGUEY PROVINCE—	
caciques of	19
territory comprising	18–19
HOLMES, W. H.—	
explorers mentioned by	24
famous race cited by	116
mention of	81, 106
HOWELL, THOMAS—	
archeological work of	40
burials discovered by	39
pottery collected by	6
HUASTEC AREA OF MEXICO, mention of pottery of	94
HUCKERBY, mention of work of	24
HUMBOLDT, stone circle described by	46
IMBERT COLLECTION, description of flask from	89
IMPLEMENTS—	
from cave middens	31
of coral and shell	37
See also ARTIFACTS.	
IM THURN—	
mention of work of	24
quoted on shell heaps	128
INCENSE BURNERS, scarcity of	61
INCISED LINES—	
a characteristic decoration	71
decorative use of	54
INCLOSURES, STONE, in Porto Rico	46–47
INTAGLIO, rare occurrence of	62
IROQUOIS POTTERY—	
reference to	65, 66
similar to Santo Domingan	110
IRRIGATION—	
in Dominican agriculture	3
noted by Morales	36
JAMAICA—	
boat-shaped vessels of, described	60
cave burials in	22
pottery forms of	67
pottery of, discussed	122–123
type of pottery from	77–78
yellow ware of	52
JAMAICA POTTERY, vessels resembling	66–67
JARABACOA, described	42–43
JOSECITO, assistance rendered by	44
JOYCE, T. A.—	
cited on Jamaican pottery	123
pottery studied by	6
quoted on Trinidad pottery	128
KAOLIN, use of	8, 50
KITCHEN MIDDENS. *See* MIDDENS.	
KNOBS, as decoration on pottery	52–53, 67
KRIEGER, H. W.—	
field work of	27–47
mention of work of	81
LA GLORIA, earthenware from	129–130
LA NAVIDAD, first colony in America	17
LA VEGA PROVINCE—	
field work in	38, 41–45
mention of pottery from	6

Page

LANGE, types of pottery illustrated by 135
LANGUAGE, in the Greater Antilles 4
LAS CASAS, works of 22
LATHROP, MR. AND MRS., mention of 26
LATIMER, mention of work of 24
LESSER ANTILLES—
characteristics of pottery of 50
origin of 13
pottery of, discussed 68–69, 125–126
LIDS—
distribution of vessels with 130
scarcity of 61
LIFE FORMS, modeling of 85–88
LINGUISTIC STOCKS OF THE WEST INDIES 2
LINNÉ, S., reference to 71, 129
LOTHROP, SAMUEL K.—
cited on Antillean culture 133
classification by, of Porto Rican pottery 72–74
MACCURDY, reference to 117
MACORISES, synonym for Ciguayans 20
MAGUA PROVINCE—
described 18
meaning of the name 18
MAGUANA PROVINCE—
described 17
meaning of the name 17
MAIZE—
in Santo Domingo 38
production of, coincident with pottery 47
See also CORN.
MANDAN POTTERY, example of, similar to Santo Domingan 111
MARA, petroglyphs near 37
MARCANO, mention of work of 81
MARIEN PROVINCE, location of 17
MARTYR, PETER—
narrative of 23
provinces named by 19
MASON, GREGORY, mention of work of 81, 82
MASON, J. A., mention of 26, 88
MATACO VEJOS, steam cooker used by 94
MATIAS, SEÑOR FELIX, acknowledgment to 43

Page

MAYA TRADERS, crops introduced by 133
MAYOBANEX—
archeological work at principal town of 33
country ruled by 18
MEASUREMENTS, explanation of 9
MERIÑO COLLECTION. *See* ARCHBISHOP MERIÑO COLLECTION.
MEXICAN TRIBES, civilization of 48
MIDDEN DEPOSITS, Ciguayan 32–33
MIDDENS—
contents of 25, 28–29
in Monte Cristi Province 36
pottery from 34
MIGRATIONS, route of, from South America 12, 105
MILLER, GERRIT S., JR., field work of 27–35
MISSISSIPPI VALLEY POTTERY, resemblance of, to Santo Domingan 109, 110–111
MODELING—
of figurine heads 84–85
of human figures 86–87
of life forms 85–88
MOLDS—
for pottery, distribution of 81
use of, in pottery making 11, 109
MONA PASSAGE, Arawak use of 13
MONKEY VASE, origin of 125
MONTANE, mention of work of 24
MONTE CRISTI PROVINCE—
a semiarid region 35
characteristic pottery of 51
field work in 35–38
type of pottery of 6–7
value of work in, to biologists 36
MONTE CRISTI RANGE, described 14–15
MONTE ISABEL DE TORRES, height of 15
MORALES, ANDREAS—
narrative based on accounts of 23
reference to 20
MORTUARY POTTERY—
boat-shaped, decoration of 66–67
forms of 59
not "killed" 59
position of 40
See also BURIALS.

MOUNDS— Page
Alabama, pottery from, resembling Antillean 88, 91
Arawak, described 45
natural, described 44
natural, mentioned 43
no burials in 45
of upright stones 46
use of 46
MUSEUM OF THE AMERICAN INDIAN, mention of 25, 123
NARRATIVES, historical, relating to Santo Domingo 22–24
NORDENSKIÖLD, reference to 132
NOSE, modeling of 85
OBER, mention of work of 24
OCEAN CURRENTS, effect of, on West Indies 13
ORINOCO RIVER—
earthenware from valley of 131
influence of, on Lesser Antilles 13
OVIEDO—
reference to 20
work by 23
PAINT, chronology determined by 56–57
PANAMAN CERAMICS, compared with Santo Domingan 129–130
PANE, RAMON—
investigations of, among the natives 19
manuscript notes of 19
natives studied by 22
PANEL FORM OF DECORATION 54
PARANA DELTA, ornamental designs on pottery of 132
PASTE—
discussion of 8
kinds of 61
PATAGONIA, pottery making in 47
PATINATION, removed by cleaning 8
PEABODY MUSEUM, mention of 6
PEARL ISLAND, pottery from 72
PERU, similarity in pottery of, to that of Santo Domingo 132
PESTLES—
of pottery 95–97
of shell 95
stone, from Samana 95
PETIT ANSE, first French settlement at 17
PETROGLYPHS— Page
near village of Mara 37
Tainan, regarded as Phoenician 26
PICTOGRAPHS, on stone inclosures 47
PINART, effigy figured by 87–88
PIPES, TOBACCO BOWL, occurrence of 109
PITS, as decorative detail, where found 62
PLATES, earthenware 60
POLYGAMY, reference to practice of 16
POMEROON SHELL HEAPS, conclusions regarding 128
PONG, assistance rendered by 44
POPULATION—
Dominican, nationality of 1
Indian, decrease of 2
Samana 33–34
stocks included in 2
PORTO RICO—
classification of pottery of 72–74
pottery of, described by Fewkes 52
POTTERY—
Alabama, compared with Santo Domingan 120
Arawak, characteristics of 3–4
buried with the dead 40
Carib, compared with Arawak 51
ceremonial, few examples of 9
classification of, by Holmes 109
collections of, in museums 5–6
decorated, stability in features of 6
development of 3
earliest type of 67
from burials 39–40, 59, 66–67
from cave middens 34
from open village sites 7
gourd-shaped 61
intact, depth at which found 7
island Arawak, classification of 51
knobbed 67
Mandan and Hidatsa 49–50
method used in describing 7–8
mortuary, not "killed" 59
of eastern United States, elements characterizing 107

Page

POTTERY—Continued.
of eastern United States, origin of 139
of Haiti 5
of Lesser Antilles, characteristics of 50
of Monte Cristi Province 37
of the Eskimos 49
Santo Domingan, affiliations of 5
Santo Domingan, characteristics of 7–8
Santo Domingan, culture area of 6–7
Santo Domingan, highest type of 61
Santo Domingan, northern affiliations of 104–120
Santo Domingan, relationships of 12
Santo Domingan, resemblance of, to that of Eastern States 61
Santo Domingan, resemblance of, to that of Gulf coast 110
stamps of, discussed 79
tribes devoid of 48–49
types of, from Samana caves 31
undecorated, question of identity of 6
unpainted, colors of 59
West Indian, embellishment of 50–51
West Indian, general origin of 106
West Indian, shaping technic of 50
See also EARTHENWARE.

POTTERY MAKING—
area of, in South America 47
development of, in America 49
development of, in South America 133–134
four areas of, in North America 47–50
supposed place of origin of 106–107

PROBLEMATICAL STAMPS 79
PROPERTY, buried with the dead 39
PROVINCES, NATIVE, classified by Peter Martyr 19

Page

PUEBLO AREA, mention of pottery of 94
PUERTO PLATA PROVINCE, mention of pottery from 6
PUNCTATE DESIGNS, occurrence of 53–54
RAINFALL, amount of, in the island 35
RANCHO VIEJO, effigy from cave at 88
RATTLE LUGS, described 83–84
RATTLES—
described 108
in form of bird figures 84
RED WARE, distribution of 52
RESERVOIRS, ABORIGINAL, use of 36
RICHETTI, LUIS, assistance rendered by 35
RIO YAQUE DEL NORTE, vessel from valley of, described 94
ROCK-LEDGE BURIALS—
offerings recovered from 44
pottery from 7, 74
RODRIGUEZ-FERRER, DON MIGUEL, structures described by 46
ROTH, W. E.—
cited on pottery 133–134
reference to 81, 87
SADDLE MOUNTAINS, archeological site in 36
ST. CROIX—
earthenware of, described 124–125
pottery from, classified 123
ST. KITTS, pottery from, described 125–126
ST. THOMAS, pottery from, classified 123
SAMANA BAY, work in caves of 27–32
SAMANA PENINSULA, briefly described 15
SAMANA PROVINCE—
Archeological work in 27–35
pottery types of 74
SANBORN, MR., pottery collection of 6
SAN JUAN DE MAGUANA—
inclosure at, described 24–25
ruins at, of stone circle 46
SAN JUAN RIVER, valley of, described 33

	Page
San Juan village site—	
exploration of	74
pottery types of	76–79
San Lorenzo Bay, exploration of caves of	25
Santa Maria, the caravel, shipwreck of	17
Santiago de los Caballeros—	
mention of	42
pottery collection at	6
Santiago Province, mention of pottery from	6
Santo Domingo—	
application of the name	1
source material to ethnology of	22–24
Santo Domingo Province, field work in	38–41
Saona, caves of, explored	25
Schomburgk, Sir Robert—	
cemetery reported by	45
stone circle described by	46
work of	24
Seminole, houses of, similar to Arawak	106
Sequene, a Florida chief, mention of	105
Shapiro, Doctor, collections obtained by	40
Shell, implements of	37
Shellfish, chief food of the cave dwellers	28
Shell heaps—	
Carib, in British Guiana	128
described by Jefferys	26–27
in caves	28
Silla de Caballo Range, archeological site in	36
"Simmons" cave, pottery fragments from	74
Skeletal material—	
at Boca Chica	40
condition of	40–41
from rock-cleft burials	32
Skulls, deformed, collection of	41
Slips—	
material used for	8
use of, on water bottles	93
Snuffing tube, use of	109
Socias, Señor Andres, collections made by	6, 37, 39, 92
South American pottery, compared with Santo Domingan	128–138
Spaniards, early government by	2
Spinden, mention of	54
Stamps—	
cylindrical	81, 82
flat, ceramics showing use of	81
patterns of	82
problematical	79
types of	80–81
use of, in pottery making	54
Stocks, linguistic, of the West Indies	2
Stone, implements of, found in caves	31
Stone collar represented in decorative designs	83
Stones, circle of	46
Stoneworking, development of	3
Stratification, in cave deposits	30
Style of pottery, indications of	8
Swanton, J. R.—	
cited on the Ciboneys	119
quoted on culture contacts	48
Symbolism in designs	71
Tainan wares, decorative zone of	57
Tempering—	
materials used in	10, 51, 59, 134
value of study of	10
Ten Kate, mention of work of	24
Thompson, mention of work of	81
Tierra del Fuego, pottery making unknown in	47
Titumate, Colombia, pottery from	72
Topography of the Dominican Republic	14–15
Trade. *See* Barter.	
Trinidad—	
no cave burials in	22
pottery of, compared with Santo Domingan	126–127
Tule Indians, pottery of	95
Type of pottery—	
examples of, described	63–104
indications of	8
means of distinguishing	7

Page

Uhle, Max, reference to 131
U. S. National Museum—
expedition of 20, 33
mention of 6
Upper Orange Key, pottery from 75
Urn burials—
character of 108
in Orinoco Valley caves 22
on the Darien coast 129–130
with secondary inhumation 32
Utuado, inclosure at 47
Variants, explanation of 66
Vases—
described 93–94
funerary 32
Vega Real, described 15–16
Venezuela, archeological remains of 131
Vessels—
boat-shaped, described 59–60, 97, 98–100
footed 61
value of study of walls of 10
with lids 61, 130
with perforated bottoms 94–95
See also Pottery.
Village Sites, excavations conducted at 35, 36
Virgin Islands—
prehistoric earthenware of 123–125
types of pottery of 50
Wapisianas, pottery of 136
Warrau, territory occupied by 12
Water bottles—
decorated, Arawakan 92
decorated with effigies 92
described 88–93
heart-shaped 65–66, 69, 92
long-necked 53
necks of, described 90
resemblances of 88
Santo Domingan, characteristics of 89
Santo Domingan, compared with others 88–89
varieties of 60
Water jar, effigy, limits of 69
West Indies—
geographical features of 12–16
subsidence of 13–14
Wetmore, work of 42
Winds, climate affected by 13
Wissler, error made by 49
Women, work of 22
Xamana, synonym for Samana 35
Xaragua Province—
cave dwellers of 20–21
described 18
irrigation in 36
Yaquino, irrigation in 36
Yellow ware, of Jamaica 52
Yucatan, Arawak intercourse with 132
Zemis, represented by figurine heads 55

EXPLANATION OF PLATES

Plate 1

Map of Santo Domingo. Provinces and topographic regions are shown

Plate 2

Map of Samana Province

The bay and peninsula of like name are indicated, as are also the several archeological sites mentioned in the text. On the north shore of the peninsula, at Puerto Escondido, was the former Ciguayan village of the cacique Mayobanex. The site is east of Punta San Juan. At Las Cañas, on the west, is another prehistoric village site. On the south shore of the peninsula, just east of Samana, the provincial capital, is the Anadel site mentioned in the text.

On the south shore of the bay are indicated the Barracote and the two Naranjo Rivers, also the Bahia de San Lorenzo and the Boca del Infierno and Caña Hondo coast. Several prehistoric shell middens not mentioned in the text are located in the vicinity of Sabana de La Mar. The delta of the Rio Yuna and the Gran Estero are shown at the west end of the bay. The entire north coast of the peninsula from the towns of Matanzas and Boca de Nagua westward to Puerto Plata was explored by Doctor Abbott.

Plate 3

Map of Monte Cristi Province

Indicated on the map are points mentioned in the text. The Silla de Caballo Mountains east of the town of Monte Cristi, with the Haitian fishing village of Petite Saline, and El Duro on the Monte Cristi-Guayubin highway (carretera) to the south are mentioned in the text in connection with prehistoric Ciguayan villages (K 2 and K 4) excavated in 1929. The Rio Yaque del Norte formerly emptied itself into Manzanillo Bay near the Haitian frontier; its waters were diverted by the Dominican Government to supply the town of Monte Cristi.

Near the border town of Dajabon is the Chacuey River, in the vicinity of which are the prehistoric earthworks mentioned in the text.

Plate 4

Carved wooden seat decorated with turtle effigy head and incised double recurved volutes and nucleated circle. U.S.N.M. No. 30052. Turks Island.

Plate 5

Profile of a figurine modeled in clay to represent a crouching human (male). Actual size. Collected by C. A. Fraser at Puerto Plata, D. R. U.S.N.M. No. 32090.

PLATE 6

Shallow bowls of the cazuela type

U.S.N.M. No. 349256. The traylike plain bowl at upper left has thick, heavy walls, rounded bottom, and straight unsymmetrical rim. Dimensions: 8¾ inches diameter, 2¼ inches deep. Constanza Valley, Province of La Vega.

U.S.N.M. No. 349373. Shallow plain bowl with thin walls slightly incurved at rim and rounded at bottom. Notch in rim with perforation underneath appears in foreground. Dimensions: 10¾ inches diameter, 3 inches deep. Andres, Province of Santo Domingo.

U. S. N. M. No. 349367. Distinguished by bilateral nodes on shoulder near margin. Corresponding indentations appear on inner surface. Flat bottom, incised band encircling lip. Dimensions: 5⅝ inches diameter, 2¾ inches deep. Andres, Province of Santo Domingo.

U.S.N.M. No. 349359. Globose bowl with sharp shoulder ridge. Inward-gazing figurine heads broken off. Panels of concentric, crescent-shaped, incised patterns laterally spaced above shoulder. Dimensions: 7¼ inches diameter, 2¾ inches deep. Andres, Province of Santo Domingo.

PLATE 7

Earthenware vessels in the National Museum of the Dominican Republic, Santo Domingo City

The vessels figured in the lower cut are from the Arawak cemetery at Andres, Province of Santo Domingo, where they were excavated by Dr. N. Alberti. No example of painted ware shown, but slipped ware is illustrated. The more elaborate bowls and water bottles above are from Santiago Province and the northern part of the island.

PLATE 8

Human effigy vases and modeled zoomorphic figurine heads

The three effigy vessels in the upper row, figured at one-tenth their natural size, are proportionately much larger than the figurine heads below, which are one-third natural size. Objects illustrated in this plate are unusual in form and design among Santo Domingan aboriginal ceramic wares. They are in the Dominican National Museum and have a provenience in the vicinity of Santiago.

PLATE 9

Unslipped terra-cotta ware water bottles from aboriginal cemetery at Andres, Province of Santo Domingo. Figured at one-tenth natural size. Collection of Dominican National Museum, Santo Domingo City.

PLATE 10

Heart-shaped water bottles from aboriginal cemetery at Andres, Province of Santo Domingo. Figured at one-half natural size. Thick-walled, flat-bottomed, unslipped terra cotta ware. Excavated by United States National Museum Expedition, 1930

U.S.N.M. No. 349381, at left, has incised vertical decorative pattern extending from lip to base. Zoomorphic figurine heads bilaterally spaced level with margin. Dimensions: 4⅝ inches deep, 3½ inches shoulder diameter, 2½ inches in sectional diameter.

U.S.N.M. No. 349382 is heavy, thick-walled, and plain except for decorative panel on lower neck where bilaterally applied figurine heads are flanked with incised lines representing body of figurine. Dimensions: 7¼ inches deep, 5⅛ inches diameter of shoulder.

U.S.N.M. No. 349383 has thick walls, plain except conventionalized figurine heads applied on lower neck. Dimensions: 8 inches in depth, 6½ inches diameter at shoulder.

PLATE 11

Water bottles from aboriginal cemetery at Andres, Province of Santo Domingo, Puerto Plata, and Santiago

U.S.N.M. No. 349382, also figured in Plate 10, appears on upper portion of plate in end view and in profile. The applied figurine is that of a frog.

The three bottles shown below are from the collection in the Dominican National Museum. The vessel at the left surmounted with the modeled figurine of a frog may be seen in profile in Plate 7. It is from the provincial collection formerly housed at Santiago.

The globose bottle with neck figurine, illustrated below at center, and the heart-shaped bottle at lower right was excavated by Doctor Alberti at Boca Chica.

PLATE 12

Neck fragments of earthenware water bottles

The fragment figured at left illustrates conventional neck design of water bottles from the northern provinces of the Dominican Republic. The modeled effigy figurine, at center, from the neck of a water bottle, is realistic, although in structural details it resembles figurines modeled generally on necks of water bottles from Santo Domingan aboriginal village sites. The example figured at right is differentiated by four punctations about the ear, and by upturned nose. It is a remarkable example of unsymmetrical design. From Constanza, Province of La Vega.

PLATE 13

Figurine heads from earthenware vessels, Andres, Province of Santo Domingo, and Constanza, of La Vega Province

PLATE 14

Fragments of earthenware water bottles. Nos. 1 and 2 from San Juan, Province of Samana, No. 3, U.S.N.M. No. 341037, from Anadel, Province of Samana

PLATE 15

Unusual types of effigy figurine heads: Nos. 1 and 2 from bottles and No. 3 from a water jar. San Juan midden, Province of Samana

PLATE 16

Modeled clay figurines from earthenware vessels. Province of Monte Cristi. Head and neck of water bottle shown at lower right

PLATE 17

Neck fragments of water bottles

The object shown at left is typical of the decorated neck panel and lip enlargement characteristic of Santo Domingan water bottles, while the fragment shown at the right differs from the usual known types. It is characterized by a gray paste, highly burnished surface; it has been covered with a white kaolin slip resembling in this respect certain earthenware vessels from Cuba.

A complete water bottle of this description belongs to Señor Andres Socias, of Copey, Monte Cristi. This particular fragment is also unusual in that it is characterized by intaglio design, a part of which is shown in the photograph. The pottery of Monte Cristi has many examples of slipped white ware similar to this. Province of Monte Cristi.

PLATE 18

Caricature figurines in modeled clay. Fragments from earthenware vessels. Province of Monte Cristi

PLATE 19

Free-hand modelings in clay of zoomorphic figurines. Provinces of Monte Cristi and Samana

PLATE 20

Modeled earthenware zoomorphic figurines. Province of Monte Cristi

PLATE 21

Zoomorphic earthenware figurines. Province of Monte Cristi

Figurines at top and center belong to unslipped terra cotta ware, crested figurine at bottom has thick chocolate-colored slip. Figurine is applied in high relief at end of trencher-shaped bowl, a portion of which is shown.

PLATE 22

An iguana; a reptilian form with two heads; and an owl figurine applied as decorative embellishment of earthenware vessels. Province of Monte Cristi

PLATE 23

Conventionalized life forms applied as figurine heads on pottery bowls. Province of Samana

PLATE 24

Decorative loop handles and lugs with figurine heads, above; and below, loop coils. Lower row includes plain looped handles, one at left having raised edges and the one at center being flattened against wall of vessel. Most handles and lugs on Santo Domingan aboriginal pottery are purely decorative, the loop rarely being large enough to be of use. Province of Samana

PLATE 25

Punctate and crosshatch decorative embellishments

No. 5 represents top of head of crested aviform; No. 3 shows random punctations on inner surface of vessel wall; No. 4 shows banded punctations on shoulder crest; while Nos. 6 and 7 show a protean form of crosshatch made by means of a spatula. Province of Samana.

PLATE 26

Aboriginal use of rectilinear, curvilinear, and punctate patterns

The characteristic etched line with terminal pit, the circle and dot, and the parallel straight line etching are more characteristic patterns for lug designs, while perforations, as shown in plate fragment at lower left, and multiple concentric circles representing conventionalized heads are infrequent. Province of Samana.

PLATE 27

Nos. 1 and 2 represent a design pattern of frequent occurrence in aboriginal pottery of Samana. They clearly show a design resembling a stone collar, the ceremonial use of which remains unknown. The multiple use of wens or of nucleated buttons shown in No. 4 is unusual, while characteristic eye modelings may be seen in Nos. 3, 6, and 8. There is no criteria available to determine the relative age of these devices. Province of Samana

PLATE 28

Clay modeling of life forms representing the frog in various degrees of conventionalization. Aviforms and rodents. Province of Samana

PLATE 29

Conventionalized forms of headdress and of crested zoomorphic figurines resembling "parrot god" patterns in worked gold from Chiriqui, Panama, as described by MacCurdy. From several sites on the Dominican north coast, Provinces of Samana and Monte Cristi

PLATE 30

Headdress forms on clay figurine heads from Monte Cristi

There is a trace of resemblance to the archaic turbaned figurines of Mexico to be seen in the figures in upper row. The two figures at bottom show a common form of conventionalized headdress apparently representing either an elaborate feather headdress or feathered tuft. The figurine at lower right is covered with a white kaolin slip which is frequently associated with the use of the spiral. Province of Monte Cristi.

PLATE 31

Mammalian and reptilian forms from Samana

The figurines shown at the top are of slipped red ware and are distinct in structure and design from those figured below, which are the more typical animal figurines applied to the coarse friable terra-cotta ware. Province of Samana.

54291—31——11

PLATE 32

The small animal figurine at the top, U.S.N.M. No. 349273, is shown in profile and from the front. It was recovered while excavating a shallow kitchen midden in the Valley of Constanza, Province of La Vega. The forms figured below represent birds and unknown mammalian forms. The figure at center with eye orbits on top of head and large gaping mouth resembles similar forms from St. Kitts of the Lesser Antilles. Constanza, Province of La Vega

PLATE 33

The three figurine heads at the left are from Porto Rico, and are covered with a brilliant red paint. The figures at the right, except the one at bottom, are of friable terra-cotta ware from Constanza, Province of La Vega. The figurine head in the lower right-hand corner is covered with a chocolate-colored slip and represents an animal form closely resembling jaguar figurines from Margarita Island and Trinidad. It is foreign to the usual Santo Domingan types. It represents, no doubt, a South American mammal. The figurine at upper right represents a species of bat (*Marmoops* sp.), although it has the appearance of a monkey head

PLATE 34

Perforated earthenware spindle whorl, clay cylinder, and disc from Province of Monte Cristi

Spindle whorls of earthenware are unusual finds in aboriginal Santo Domingan kitchen middens. The cylindrical object illustrated at the center is an earthenware stamp from the Province of Monte Cristi. Many potsherds excavated in the former Ciguayan village site designated K 2 in the text show impressions similar to that etched on this tubular earthenware stamp. This particular object can not have been used, however, to produce such etched designs, as they would have then appeared in relief instead. Doctor Fewkes illustrates a similar cylindrical earthenware stamp from the Archbishop Meriño collection. Another was recovered by Doctor Abbott and is now in the Museum collection. The unsymmetrical, flat, disk-shaped object with incised lines, shown at bottom, is frequently found in Santo Domingan kitchen middens. Province of Monte Cristi.

PLATE 35

Fragments of flat earthenware inscribed disks excavated in the Province of Samana

The fragmentary object, No. 6, U.S.N.M. No. 341023, is perhaps an earthenware spindle whorl different in type from the spherical spindle whorl shown in Plate 34.

PLATE 36

At the top are figured two fragments of circular, flat disk stamps, while the discoidal stamp third from the left has a handle attached, U.S.N.M. Nos. 349391, 349393, 349260, respectively

This object might well have been used in applying stamped V-shaped patterns on the yet plastic surface of earthenware vessels. Attempts were made in the laboratory to use it in this manner with results closely resembling stamped or etched angular designs on earthenware vessels from the Province of Santo Domingo.

These three objects are from the midden of Andres, Province of Santo Domingo. The figure at upper right shows a foot and thickened knee of a leg from a human figurine which is missing, U.S.N.M. No. 349391. It is 3⅛ inches in length and is covered with a red slip. Andres, Province of Santo Domingo.

The incised fragment at lower left shows the inside of a vessel from a midden in the valley of the Tireo River, Province of La Vega. It is unusual in that the wall section is one-half inch in thickness, well fired, and perforated near the margin to represent the eye of a figurine modeled on the surface near the margin.

The two fragmentary figurines at center, U.S.N.M. Nos. 349269 and 349270, are zemi figurines, 5 inches in length and 1½ inches in thickness, and came from a rock ledge burial in the valley of the Limoncilla, Province of La Vega.

The anthropomorphic figurine with rim fragment in the lower right-hand corner is from an earthenware plate excavated near the aboriginal earthworks just north of the town of Constanza, Province of La Vega.

PLATE 37

Incised and relieved decorative patterns forming panels on earthenware bowls

The T-shaped patterns, also the meandered spiral, are similar to those of the tubular earthenware stamp figured in Plate 34. Patterns shown on this plate were made, however, in free-hand, with the exception of the one next to the bottom at the right, which is in relief and might readily have been made with a cylindrical stamp; this applies also to the spiral pattern at the top.

The water bottle fragment in lower left-hand corner is covered with kaolin slip and shows a relieved decorative panel as well as incised line patterns. Province of Monte Cristi.

PLATE 38

Incised patterns forming decorative designs on or near the rim of earthenware plates resembling very much an ordinary dinner plate. Province of Monte Cristi

PLATE 39

Aviform modelings applied to rim of earthenware vessels. Province of Monte Cristi. The upper figure resembles in head form what MacCurdy terms the "parrot god" of ancient Chiriqui.

PLATE 40

Earthenware bowl fragments from Jamaica and Santo Domingo

The vessel fragment figured above, U.S.N.M. No. 341667, is from a cave near Kingston, Jamaica, and is typical of the thin-walled, knobbed, yellow ware of that island.

The bowl fragment shown in center, U.S.N.M. No. 11569, was collected by Gabb in Samana. It is a typical globose terra-cotta ware bowl with applied figurine head near margin.

The bowl fragment below, U.S.N.M. No. 349389, is from the midden at Andres, Province of Santo Domingo. Not clearly shown is the panel of crosshatch scarification, crudely applied. The bowl is otherwise plain.

PLATE 41

Two examples of boat-shaped, globose, knobbed, yellow-ware burial vessels from a cave near Kingston, Jamaica, U.S.N.M. Nos. 341664 and 341669

PLATE 42

Vessels shown at top row are trencher-shaped yellow-ware burial vessels from a cave near Kingston, Jamaica

The bowls are plain except for projecting points at ends, which, in the case of the vessel on the right, is provided with knobbed projections, U.S.N.M. No. 341661. At one end of this vessel a calcareous deposit including several human teeth is visible.

The bowls in the lower row from left to right, U.S.N.M. Nos. 349357, 349368, and 349353, were excavated in the aboriginal cemetery adjoining the Dominican village of Andres, Province of Santo Domingo. Dimensions of the bowl in the lower left-hand corner are, length 5½ inches, depth 1¾ inches; of the bowl in the lower right-hand corner, length 5¼ inches, depth 3½ inches. The dimensions of the vessels from Jamaica shown in the upper portion of the plate are not true to scale, being relatively twice the size of those shown below.

PLATE 43

Boat-shaped vessels and a 4-lobed, heavy-walled earthenware jar

The vessel at left is a reconstruction of bowl end fragments collected by Dr. W. L. Abbott in northern Santo Domingo.

The vessel at the right, U.S.N.M. No. 221079, was collected by Doctor Fewkes in Porto Rico. There is a resemblance in thickness of wall and in shape to the trencher-shaped vessels from Jamaica, but the color and paste differ. It is also provided, as may be seen, with looped handles, while the Jamaican forms are provided with knobs representing conventionalized animal heads.

The lobed earthenware jar figured at the center was recovered by Dr. W. L. Abbott from the Cueva de Roma in northern Santo Domingo. This vessel is unusual in the extreme, in thickness of wall, in shape, in paste, but not in applied ornamentation, no other vessel of this type being known in any collection of aboriginal pottery from Santo Domingo. U.S.N.M. No. 316445.

PLATE 44

Two boat-shaped earthenware vessels from Cape Maise, Santiago, Province of Oriente, U.S.N.M. Nos. 215405 and 215406, collected by C. J. Frye

They resemble undecorated boat-shaped vessels from Jamaica, however, with this distinction, that Jamaican vessels are knobbed at the raised prow and stern, while these examples of Cuban wares are provided with obliquely placed slab extensions of the rim. These serve as handle lugs, but are apparently deteriorated conventionalized life forms. A perforation has been made at the center of each lug. The discolorations on the vessel at the right are due to weathering. Neither of the examples shown is provided with a slip. Dimensons: 10½ inches in diameter, 5½ inches in depth.

PLATE 45

Top: Cast of painted earthenware vessel. Island of St. Kitts. U.S.N.M. No. 229777, collected by C. W. Branch. Bottom: Globular bowl of painted, thin-walled red ware from Guayubin in the valley of the Rio Yaque del Norte. Province of Monte Cristi.

The introduction of paint in polychrome design covering the entire outer surface of the St. Kitts earthenware vessel at once sets this hemispherical bowl apart from shallow Dominican earthenware types. It is further characterized by a heavy rim reinforcement on the outside of the upper coil. The general effect of the entire vessel is that of massiveness due to sectional thickness of walls.

The vessel from northern Santo Domingo shown at bottom of the plate reveals traces of thick red paint still adhering to the outer walls. This globose bowl was collected by Dr. W. L. Abbott in the vicinity of Guayubin, Province of Monte Cristi, U.S.N.M. No. 293016. This vessel is unusual because of the extreme convexity of incurved walls, forming a narrow neck orifice. Two perforations have been made near the margin. The incised line patterns appearing on the incurved walls above the shoulder are different from other known examples of Santo Domingan earthenware vessels.

PLATE 46

Four vessels are shown; the two upper being from a midden at Andres, Province of Santo Domingo, the two below from a midden at Monte Cristi

The globose bowl at upper left, U.S.N.M. No. 349352, is 8 inches in diameter and 4¾ inches in depth. Anthropomorphic figurines are applied to rim while a decorative panel of incised lines and terminal pits in series alternating with concentrically incised circles embellishes the outer walls near the margin.

The bowl at upper right, U.S.N.M. No. 349354, diameter 6¼ inches, depth 3½ inches, is unique in aboriginal pottery collections from Santo Domingo. It represents a cylindrical vessel inserted in a shallow traylike bowl of cazuela type. It is covered with a dark red slip and ornamented in its upper portion with encircling incised bands and bilaterally applied conventionalized animal figurines. Although unique in collections from Santo Domingo there is no evidence that would indicate its origin in northern Florida, where similar vessels have been found.

The two small bowls at bottom accompanied child burials found near the bottom of the midden designated K 2 near Monte Cristi.

The outward-flaring rim of the unsymmetrical bowl in lower right-hand corner is somewhat unusual.

PLATE 47

Four examples of bowls recovered from San Juan midden, Samana, in 1928

No. 1 is a boat-shaped bowl, belonging to the coarse and friable, brown-colored terra-cotta ware, with pronounced shoulder and high projections of rim at either end surmounted with conventionalized zoomorphic figurine heads, U.S.N.M. No. 341019.

No. 2 is a 2-compartment bowl belonging to the red-ware group. Like Nos. 1 and 3 it accompanied child burials at the bottom of the San Juan midden. It is 6½ inches long and 2½ inches in depth. The walls of red-ware vessels are thicker and show better firing than those belonging to the brown or terra-

cotta ware. The vertical reinforcing bands occurring in parallel are apparently deteriorated conventionalized life forms.

No. 3 is a globose red-ware bowl, plain as to surface and like No. 2 of Plate 45, is characterized by a narrow oral orifice, U.S.N.M. No. 341020. Dimensions: $4\frac{7}{8}$ inches in diameter; $3\frac{2}{5}$ inches in depth.

No. 4 is a proportionately larger vessel and does not appear in its proper relative size on this plate. It was found in Cueva del Templo on the south shore of Samana Bay. The bottom of the bowl near the outer surfaces is thickly incrusted with soot.

PLATE 48

The vessel shown at the top was recovered from the Indian cemetery at Andres. The margin, which is broken off, has not been restored. U.S.N.M. No. 349374. Dimensions: 7¾ inches in diameter and 5 inches in depth.

The vessel below belongs to the slipped chocolate-colored group and was recovered while excavating at the K 2 site in the Province of Monte Cristi. The encircling band of tear-shaped punctations distinguishes this vessel from other punctated groups of the north coast. So far as is known, no punctated ware appears on the south coast, but is limited in its distribution to the mountainous interior and northern portions of the island.

PLATE 49

The vessels shown are not proportionately true to scale, as those in the upper row are much larger than those figured below. In fact, the vessel in the upper right-hand corner is the largest vessel recovered by the Museum expedition. It is 14½ inches in diameter at the shoulder and 5½ inches in depth. The usual encircling decorative panel appears above the shoulder and consists of incised and relieved figures, and the conventionalized animal figurines appear as a bilaterally placed pair of ornamental lugs. Arawak Cemetery, Andres

The vessel at the center of the top row is plain surfaced except for small indented nodal handles. Dimensions: 8 inches in diameter at shoulder, 5 inches in depth. U.S.N.M. No. 349375. Cemetery at Andres, Province of Santo Domingo.

The spherical vessel at upper left is oval and boat-shaped, plain surfaced, and belongs to the terra-cotta unslipped group. Dimensions: 5½ inches in diameter, 3¼ inches in depth. U.S.N.M. No. 349371. Andres, Province of Santo Domingo.

The vessel in the lower right-hand corner is plain, crudely finished, and unsymmetrical. The few unsymmetrical bowls recovered at Andres offer no criteria of value in a stratigraphical study as the finds are of a uniform depth and apparently of like age. Dimensions: 4½ inches in diameter, 2¾ inches in depth. U.S.N.M. No. 349370.

The shallow food bowl in lower left-hand corner is 4½ inches in diameter and 2 inches in depth. It is heavy walled and plain surfaced. It belongs to the black ware group. U.S.N.M. No. 349369.

The globose vessel at the center of the lower row is introduced for purposes of comparison. It was figured by Fewkes in the Twenty-fifth Ann. Rept. Bur. Amer. Ethn., in Plate 77, and was recovered at Utuado, Porto Rico. It is 4 inches in diameter and 2¾ inches in depth. There is little to distinguish this type of decorated bowl from the terra-cotta group of Santo Domingo. All the vessels shown in this plate are from Andres, Province of Santo Domingo, except the last mentioned, which is from Utuado, Porto Rico.

PLATE 50

The bowls shown are not illustrated on the same scale; the one at the top, U.S.N.M. No. 349348, being 11⅝ inches in diameter and 6¼ inches in depth, while the vessel at the center, U.S.N.M. No. 349364, is 7 inches in diameter and 3 inches in depth, and the one shown below, U.S.N.M. No. 349350, is 8¾ inches in diameter and 6¼ inches in depth

These vessels show a variety in form and design. The sharply defined shoulder ridge of the upper boat-shaped vessel may be contrasted with the shoulder constriction of the vessel at bottom.

The shallow cazuela type bowl at the center has elaborately decorated rim extensions serving as lugs. So far as perforations and placing of these lugs applies there is a resemblance with vessels figured in Plate 44 from Cape Maise, Cuba. From cemetery at Andres, Province of Santo Domingo.

PLATE 51

The shallow traylike vessel at the top, U.S.N.M. No. 316454, is a reconstruction made in the Museum laboratory from rim fragments and handle lugs. It is typical of forms from the northern part of the island

The vessel shown at the center, U.S.N.M. No. 349360, is 5¾ inches in diameter and 2¼ inches in depth. Only one animal figurine has been applied to the wall near the margin where it appears to gaze into the vessel. Other known examples from Santo Domingo have bilaterally placed figurine heads at or near the margin.

The vessel below, a shallow cazuelalike type of food bowl. U.S.N.M. No. 349349, is 9 inches in diameter and 3⅜ inches in depth. The walls are a chocolate brown covered with a burnished slip. From cemetery, Andres, Province of Santo Domingo.

PLATE 52

On this plate are shown three vessels, each with two views, profile and end, so as to show the paneled incised lines as well as the relieved decoration in form of figurines at either end

The vessel at the top, U.S.N.M. No. 349365, is 3¾ inches in diameter and 2 inches in depth. The flat bottom forms a slightly pronounced annular base which is much less common to Santo Domingo than the simple flat or rounded bottoms.

The vessel shown in the central panel, U.S.N.M. No. 349379, is 3¾ inches in diameter and 3⅜ inches in depth. It is characterized by a constriction at the middle and an alternate frieze resembling that of Iroquoian forms. The plain floor portion is oval, while the upper decorated part is oblong and boat shaped.

The vessel figured below, U.S.N.M. No. 349380, is 3¾ inches in diameter and 4⅜ inches in depth. The central constriction is much less pronounced, but the effect remains the same.

This type of vessel approaches the type found in Panama, also in Florida, in which one vessel appears superimposed on another. The bottom of the upper is removed, and the walls continued to form the lower vessel. From cemetery at Andres, Province of Santo Domingo.

PLATE 53

Earthenware griddle or roasting slab. Dimensions: 10 inches in diameter, 1 inch in section. The rim is slightly raised, but the surface is otherwise smooth and flat. The reverse or bottom shows textile imprint, perhaps that of the mat or basket on which it was modeled. From burial cave near Constanza, Province of La Vega. U.S.N.M. No. 349257.

PLATE 54

Four vessels are shown in profile and end views, the upper, U.S.N.M. No. 349308, having a diameter of 5½ inches and a depth of 3¼ inches. The vessel next to the top, U.S.N.M. No. 349351, is 9⅛ inches in diameter and 6 inches in depth. Conventionalized recumbent figurines are applied to the outer rim surface. Terminal punctations in series characterize this type of vessel both on encircling decorative rim panels and constricted shoulder

The vessel next to the bottom appears likewise in end and profile views and illustrates the pronounced marginal concavity or arc at the oral sector. It is further characterized by sharply defined shoulder ridge, and horizontally placed figurine heads, the placement of which is vertical. Dimensions: 10¼ inches in diameter, 5¾ inches in depth. U.S.N.M. No. 349355.

The effigy vessel shown at bottom is unique in several ways. The heavy walls are covered with the dark red slip which unfortunately was removed in the laboratory when the vessel was cleaned with hydrochloric acid solution. The photograph of this vessel, as well as of all the other vessels shown, was taken before cleaning, so they appear with the natural patina due to age, and also with the artificial slip or paint covering. The head of the animal figurine (turtle) takes on the form of a perforated spout 1 inch in length, the perforation extending through the walls of the vessel as well. Dimensions: 7 inches in diameter and 3¾ inches in depth. U.S.N.M. No. 349356. From La Caleta, Province of Santo Domingo.

PLATE 55

Earthenware pestles and figurines. Constanza midden, Province of La Vega.

The pestles in the top row are either plain or have a crude face cut at one side. The bulbous lenses are carved. Stone pestles have a flat bottom or lens.

The pestle at upper left, U.S.N.M. No. 349264, is 2 inches in length, 1¼ inches in diameter. The pestle shown at center top row is 2 inches in length and 1 inch in diameter. U.S.N.M. No. 349265. Pestle shown at upper right is 2½ inches in length and 2 inches in diameter. U.S.N.M. No. 349263.

The objects shown in the middle row are figurines partaking of the general form of earthenware pestles. The one at the left is 2¾ inches in length with a diameter of 1⅞ inches. An anthropomorphic head is sculptured at the side of the shaft. U.S.N.M. No. 349262.

The earthenware figurine at center is anthropomorphic. Dimensions: 3 inches in length, 1¼ inches in diameter. A perforation passes from middle of back to base of figure.

The figurine at the right of the middle row has a curved bottom filled with punctations similar to those appearing on discoidal earthenware stamps. Dimensions: 4 inches in length, 2¼ inches in diameter. U.S.N.M. No. 349259.

The lower row shows a group of conventionalized figurines. The one at left represents an iguana such as is frequently modeled and applied to the walls of earthenware vessels as a handle lug.

The effigy figurine at center with its broken arm members and missing base represents the top and neck of a water bottle, while the hybrid figurine in the lower right-hand corner has a human effigy face and an aviform body with winged members and tail indicated. Apparently this figurine had served as a handle lug. From Constanza midden, Province of La Vega.

Plate 56

Small food bowls; earthenware burial offerings

Two vessels shown in top row are from Constanza, Province of La Vega. U.S.N.M. Nos. 349255, 349256. They belong to the thin-walled black-ware group.

The vessel at the left has an incipient annular base, while the bottom of the vessel on the right is rounded. Looped handles are broken off from both vessels.

In the row next to the top are figured two vessels: The shallow food bowl on the left being 4⅛ inches in diameter and 1¼ inches in depth, U.S.N.M. No. 349361; and the vessel at the right being 6 inches in diameter and 3½ inches in depth, U.S.N.M. No. 349363. They belong to the black-ware group.

In the row next to the bottom are shown two unsymmetrical food bowls. The one at left with looped handle missing is decidedly lopsided. It is 5 inches in diameter and 3¾ inches in depth. U.S.N.M. No. 349378.

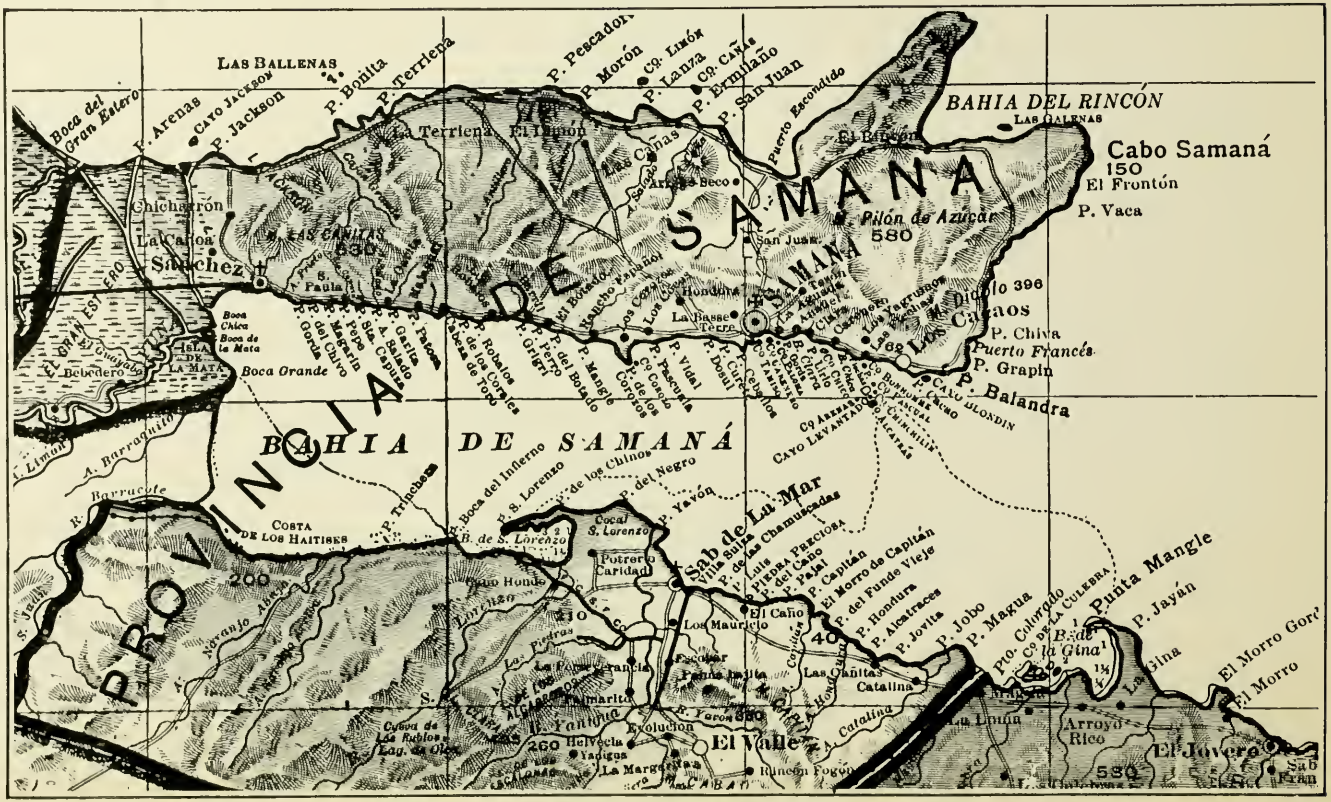
The bowl at right is globose with a pronounced vertical rim extension. It is 5 inches in diameter and 3¾ inches in depth. U.S.N.M. No. 349377.

The bottom row depicts two globose food bowls belonging to the granular terra-cotta group. The one at left without handle lugs has a diameter of 4¾ inches and a depth of 3 inches. U.S.N.M. No. 349372. The vessel shown at lower right has the usual encircling decorative panel above shoulder and conventionalized bilaterally spaced figurine heads. It is unsymmetrical and characterized by a pronounced vertical rim extension. It is 4½ inches in diameter and 3¼ inches in depth. U.S.N.M. No. 349376.

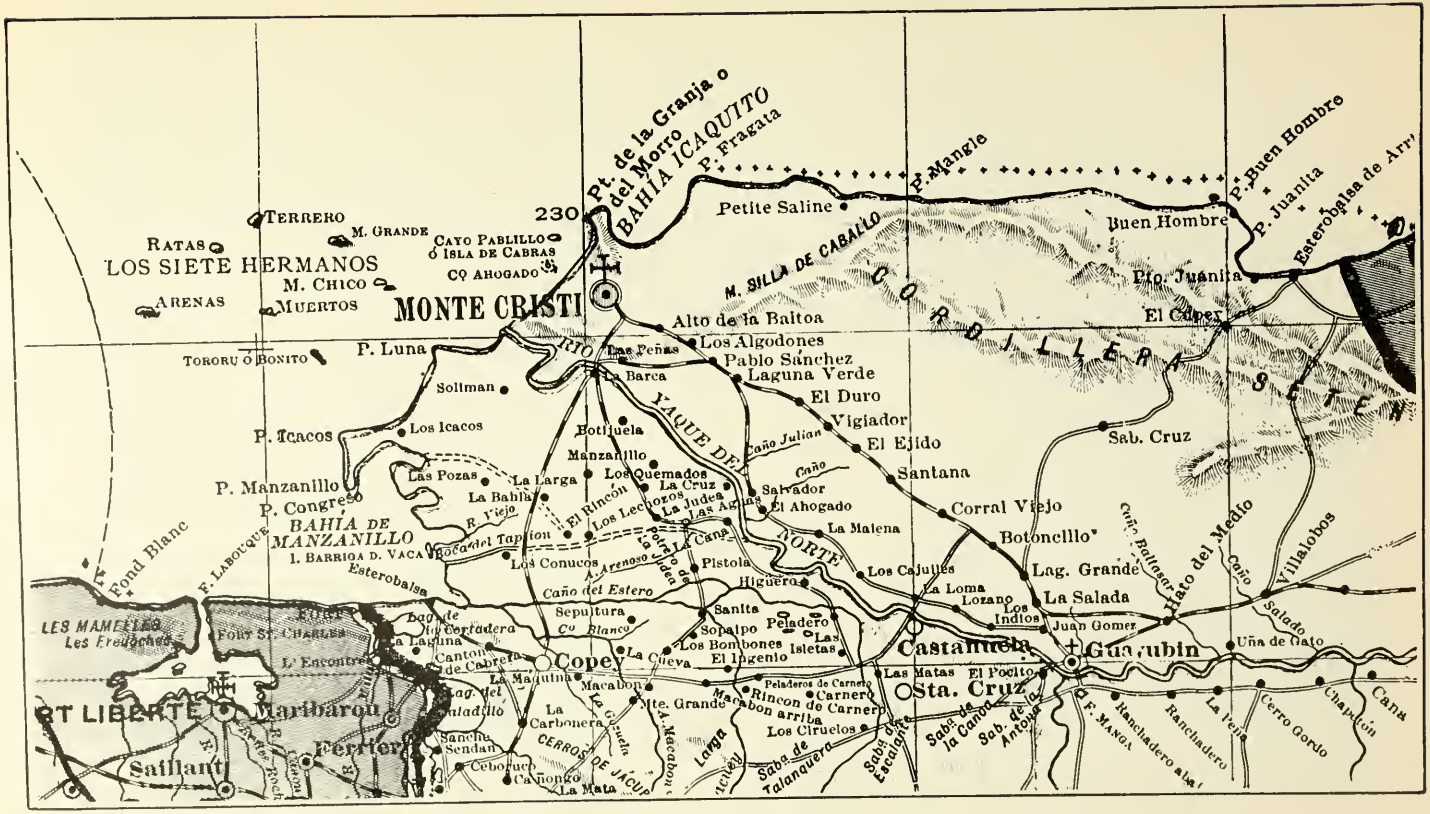
All vessels figured in this plate are from the cemetery at Andres, Province of Santo Domingo, except in the upper row, which are from the valley of Constanza, Province of La Vega.

54291—31——12

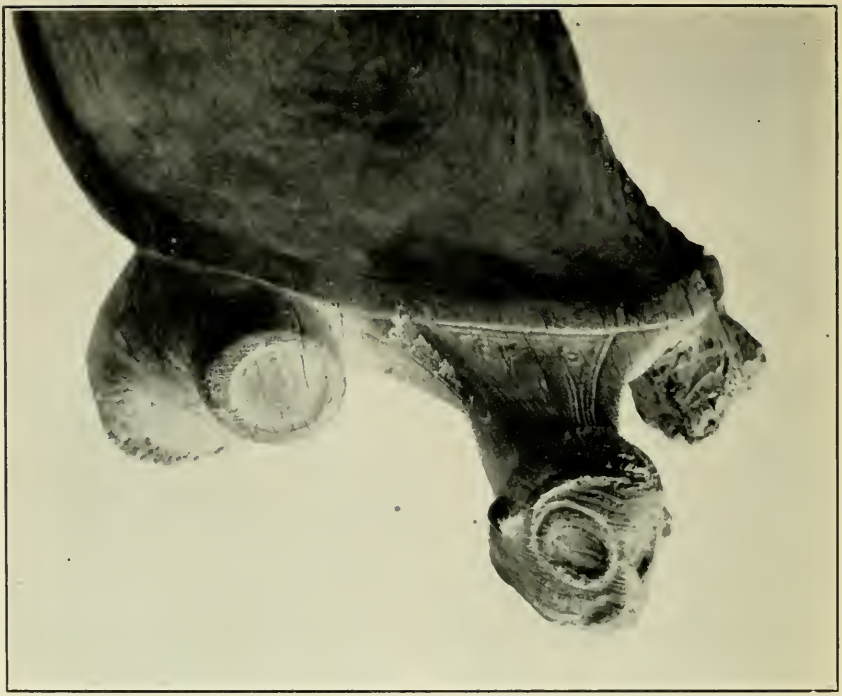
MAP OF THE DOMINICAN REPUBLIC



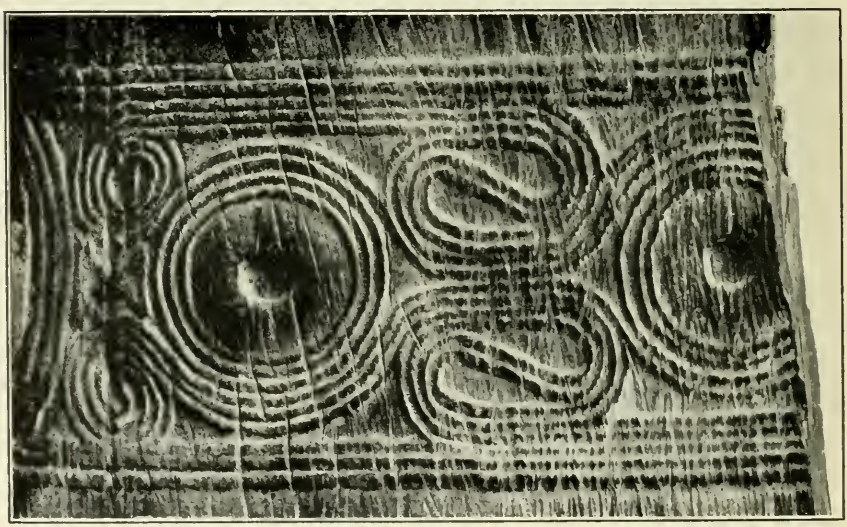
MAP OF SAMANA PROVINCE, PENINSULA, AND BAY, SHOWING ARCHEOLOGICAL SITES WORKED IN 1928



MAP OF MONTE CRISTI PROVINCE, SHOWING ARCHEOLOGICAL SITES WORKED IN 1929



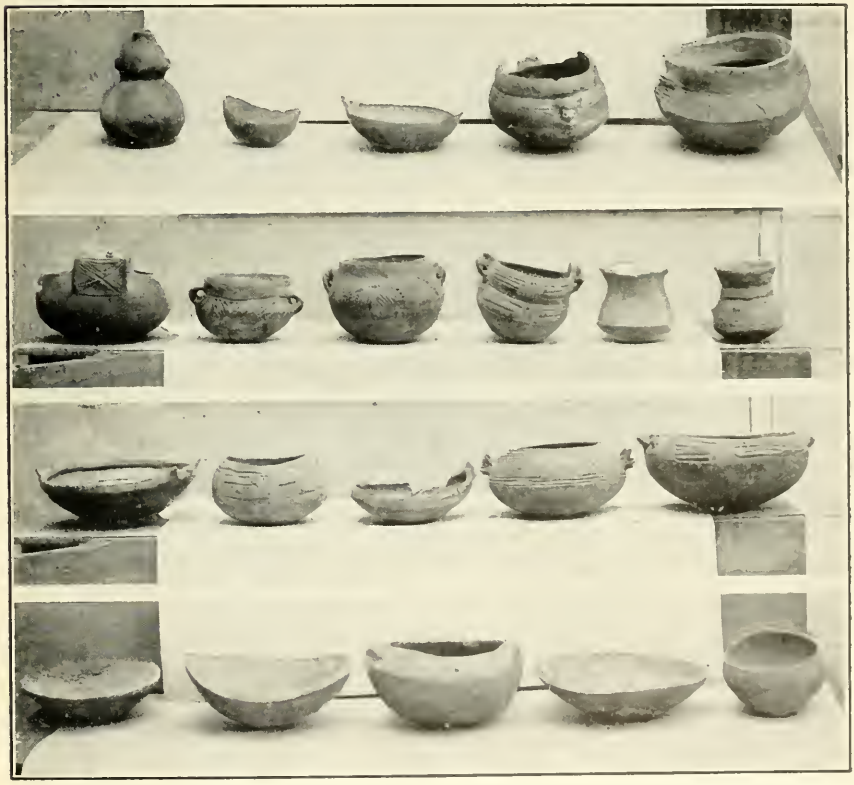
CARVED WOODEN SEAT WITH EFFIGY OF A TURTLE. TURKS ISLAND



CARVED SECTION OF WOODEN SEAT SHOWING INCISED VOLUTES AND CIRCLE

PROFILE OF A HUMAN FIGURE MODELED IN CLAY, AN EXCELLENT EXAMPLE OF PLASTIC SCULPTURE FROM PUERTO PLATA, SANTO DOMINGO

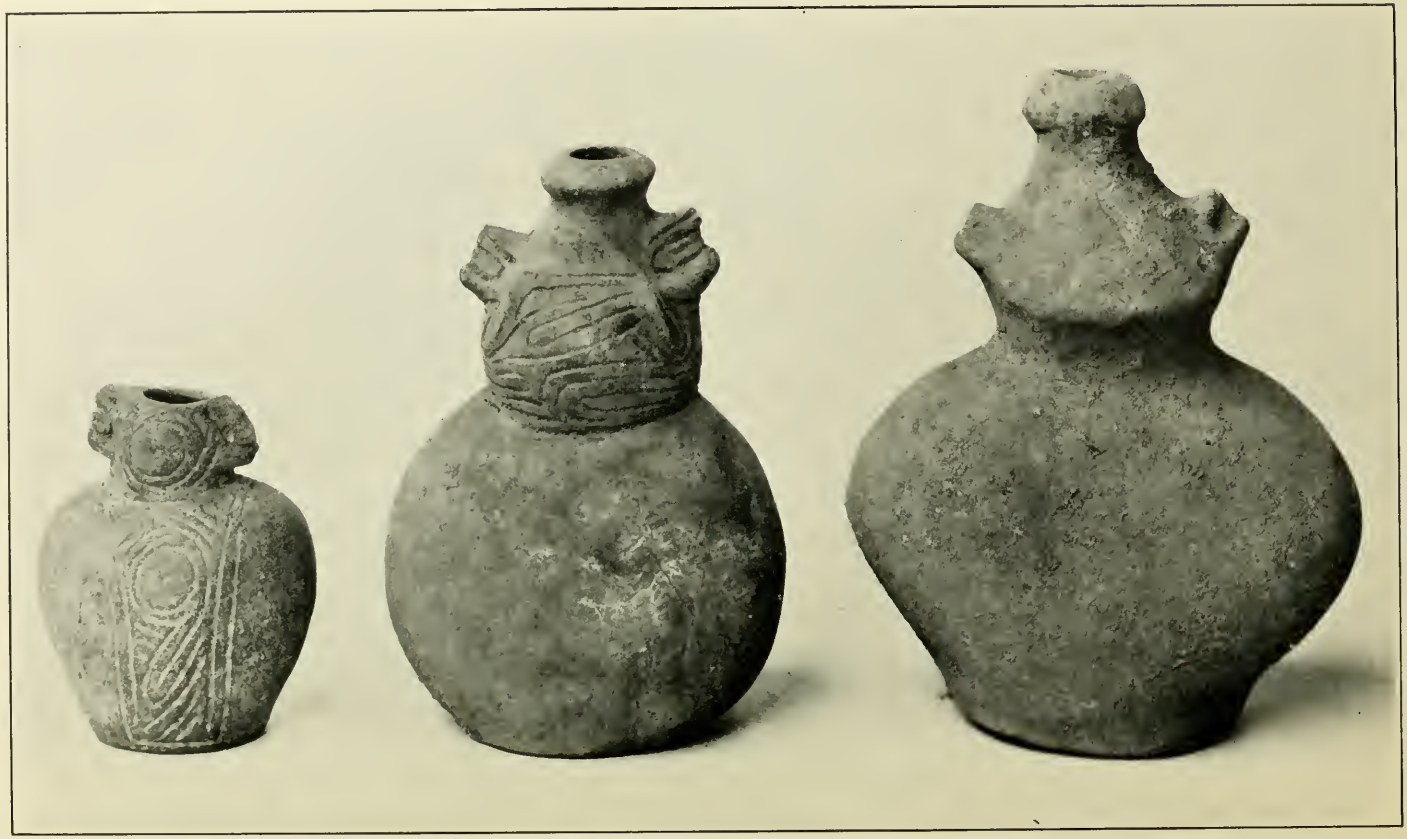
SHALLOW BOWLS OF THE CAZUELA TYPE. CONSTANZA, PROVINCE OF LA VEGA, AND ANDRES, PROVINCE OF SANTO DOMINGO



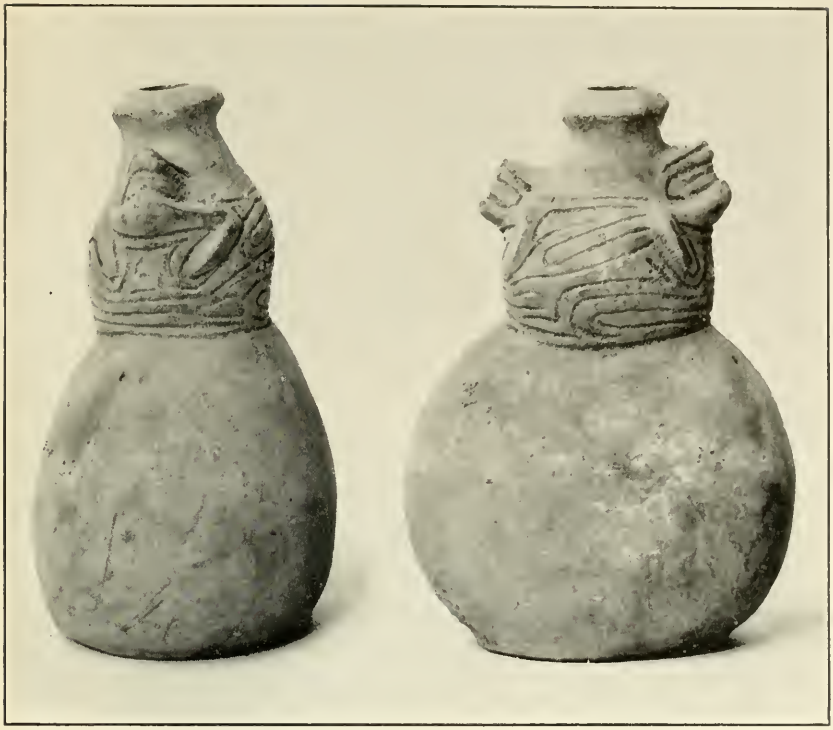
EARTHENWARE VESSELS IN THE DOMINICAN NATIONAL MUSEUM. PRINCIPALLY FROM ARAWAK CEMETERY AT ANDRES, PROVINCE OF SANTO DOMINGO

ABOVE, EFFIGY WATER BOTTLES, ONE-TENTH NATURAL SIZE. DOMINICAN NATIONAL MUSEUM, FROM CEMETERY AT ANDRES, PROVINCE OF SANTO DOMINGO; BELOW, ZOOMORPHIC FIGURINE HEADS OF CLAY. DOMINICAN NATIONAL MUSEUM, FROM VICINITY OF PUERTO PLATA AND SANTIAGO. ONE-THIRD ACTUAL SIZE

WATER BOTTLES FROM ABORIGINAL CEMETERY AT ANDRES, ONE-TENTH NATURAL SIZE. PROVINCE OF SANTO DOMINGO



HEART-SHAPED WATER BOTTLES FROM ANDRES. ONE-HALF NATURAL SIZE. PROVINCE OF SANTO DOMINGO



WATER BOTTLES FROM ANDRES, PUERTO PLATA, AND SANTIAGO

NECK FRAGMENTS OF EARTHENWARE WATER BOTTLES. CONSTANZA, PROVINCE OF LA VEGA

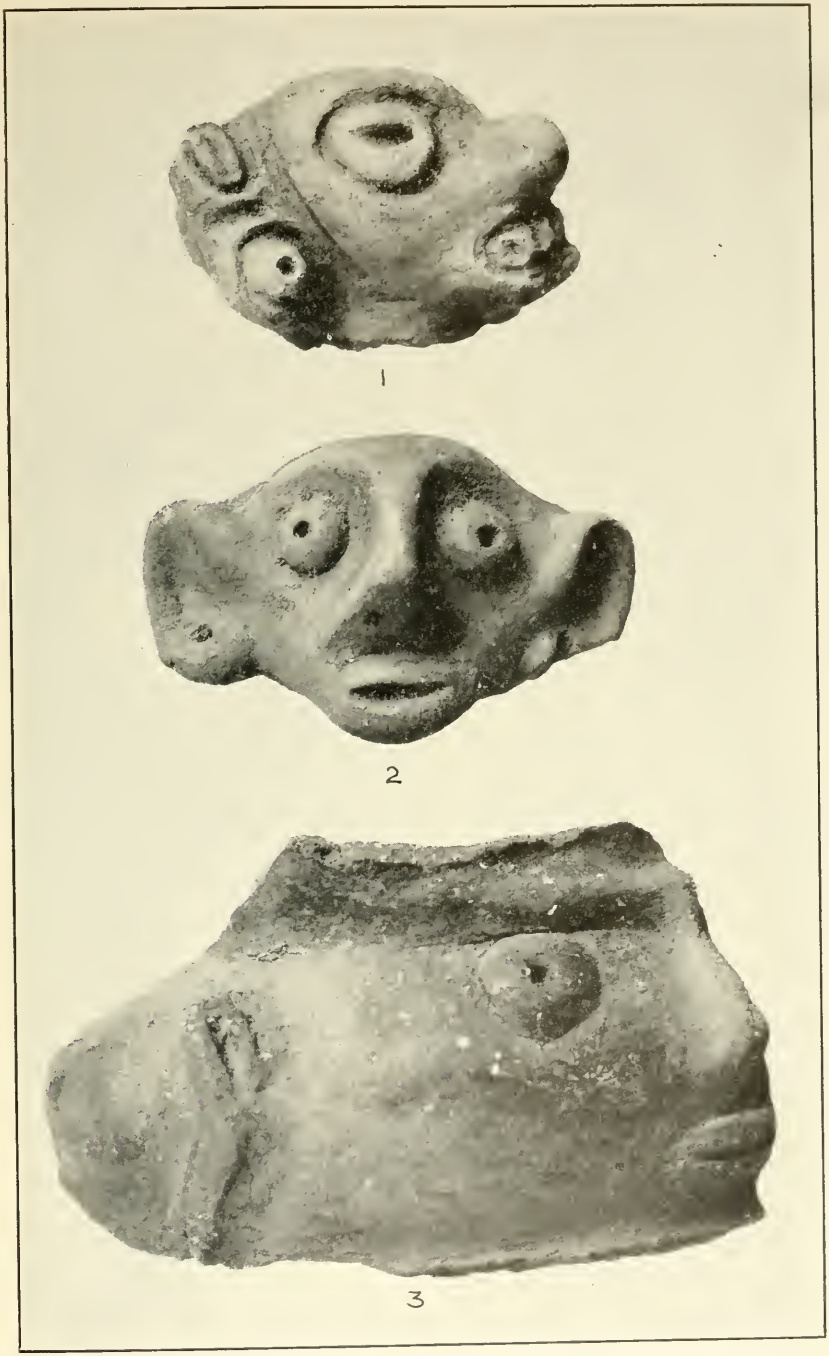
FIGURINE HEADS FROM ANDRES AND CONSTANZA MIDDENS. PROVINCE OF LA VEGA

1

2

3

FRAGMENTS OF EARTHENWARE WATER BOTTLES. SAMANA PROVINCE

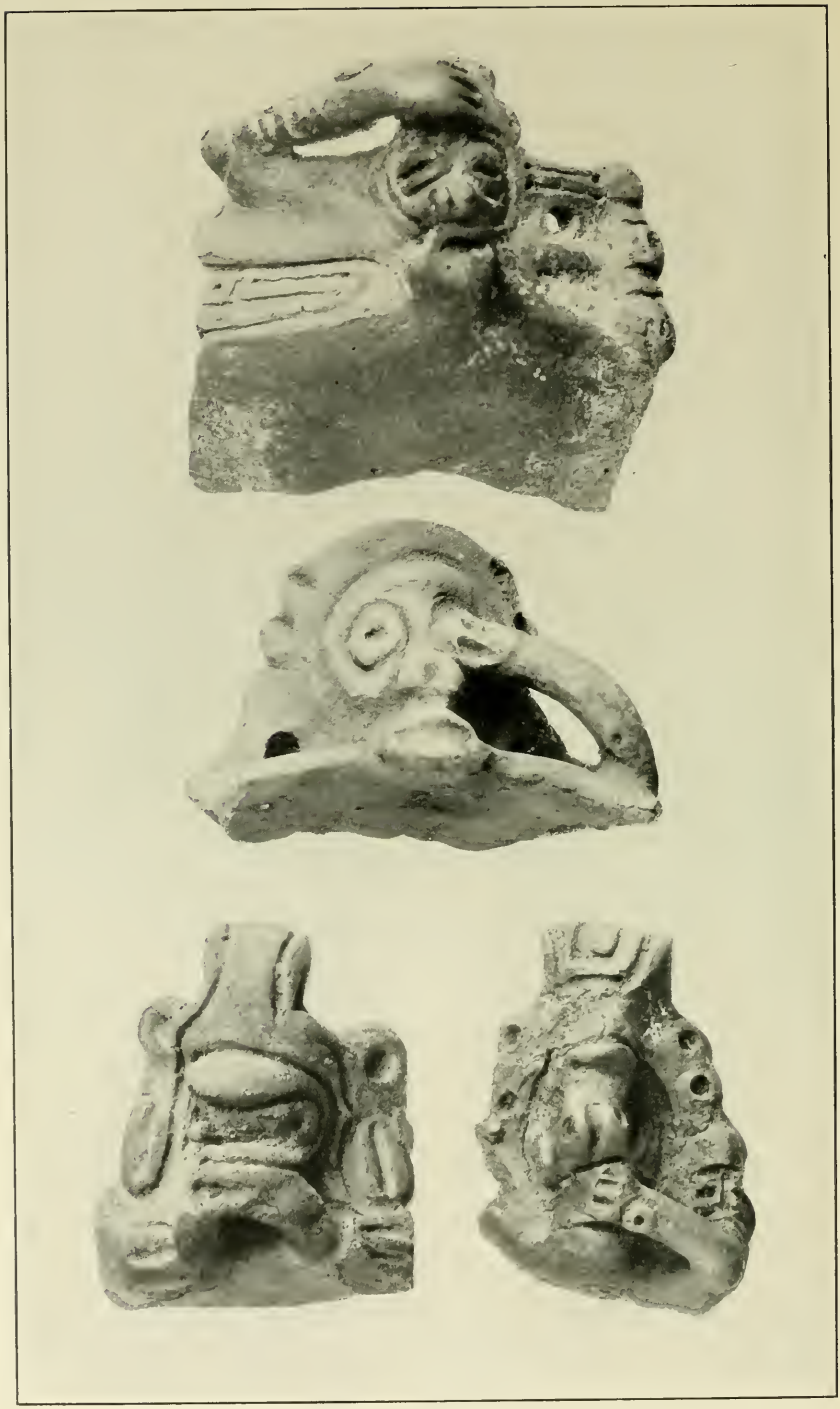


EFFIGY FIGURINE HEADS FROM SAN JUAN MIDDEN. SAMANA PROVINCE

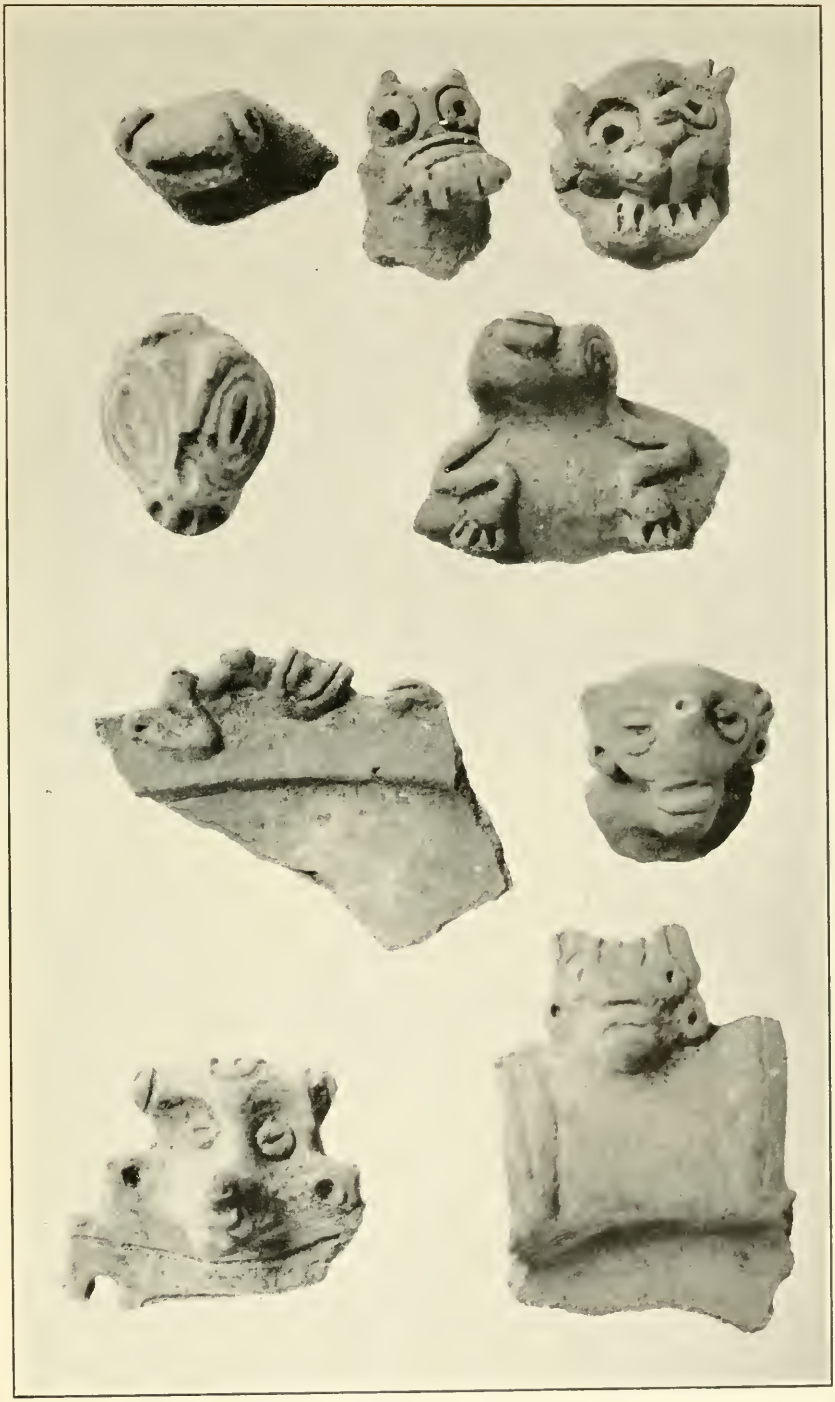
54291—31——13

FIGURINE HEADS OF MODELED CLAY FROM MONTE CRISTI PROVINCE

FRAGMENTS OF WATER BOTTLES. PROVINCE OF MONTE CRISTI



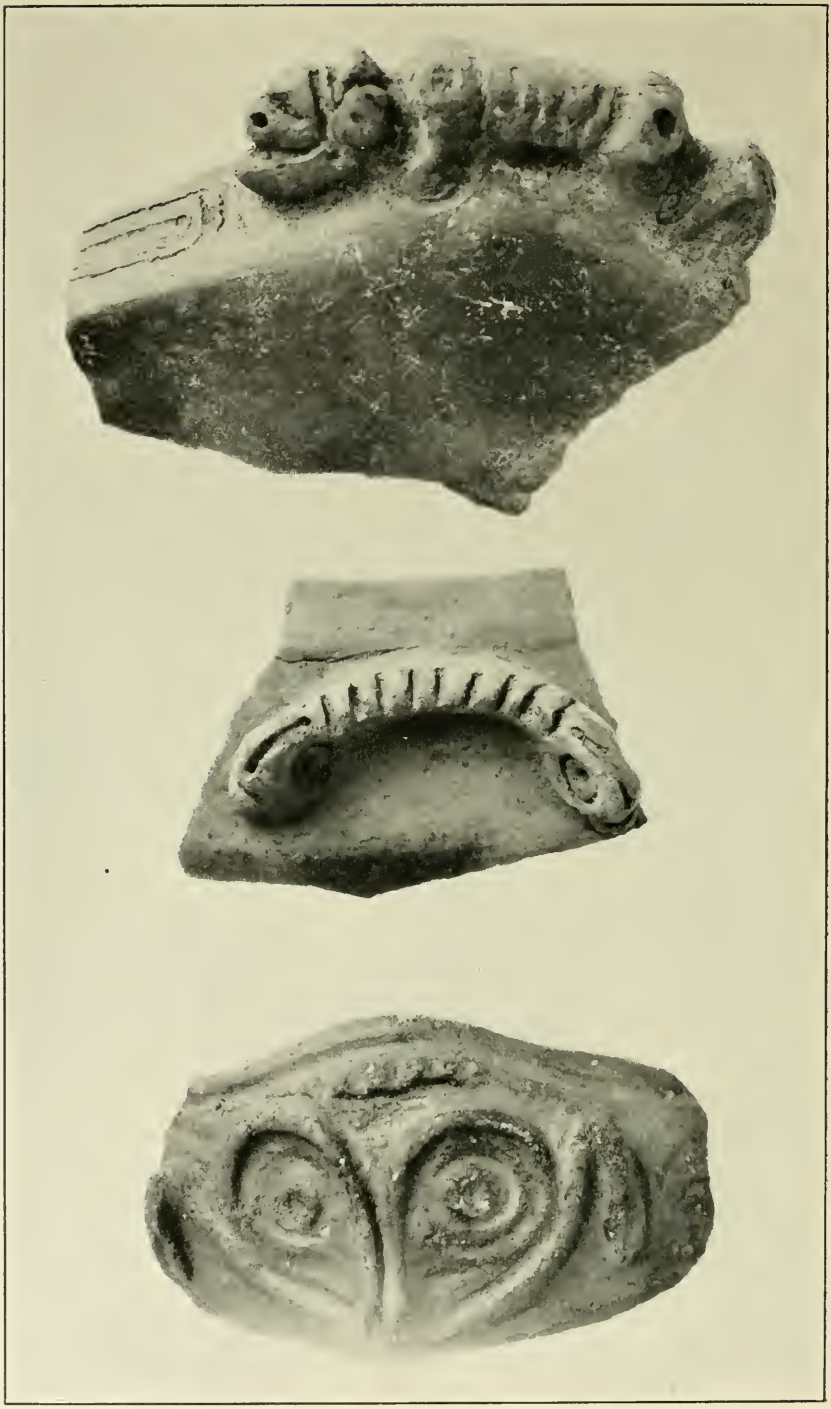
CARICATURE FIGURINES. PROVINCE OF MONTE CRISTI



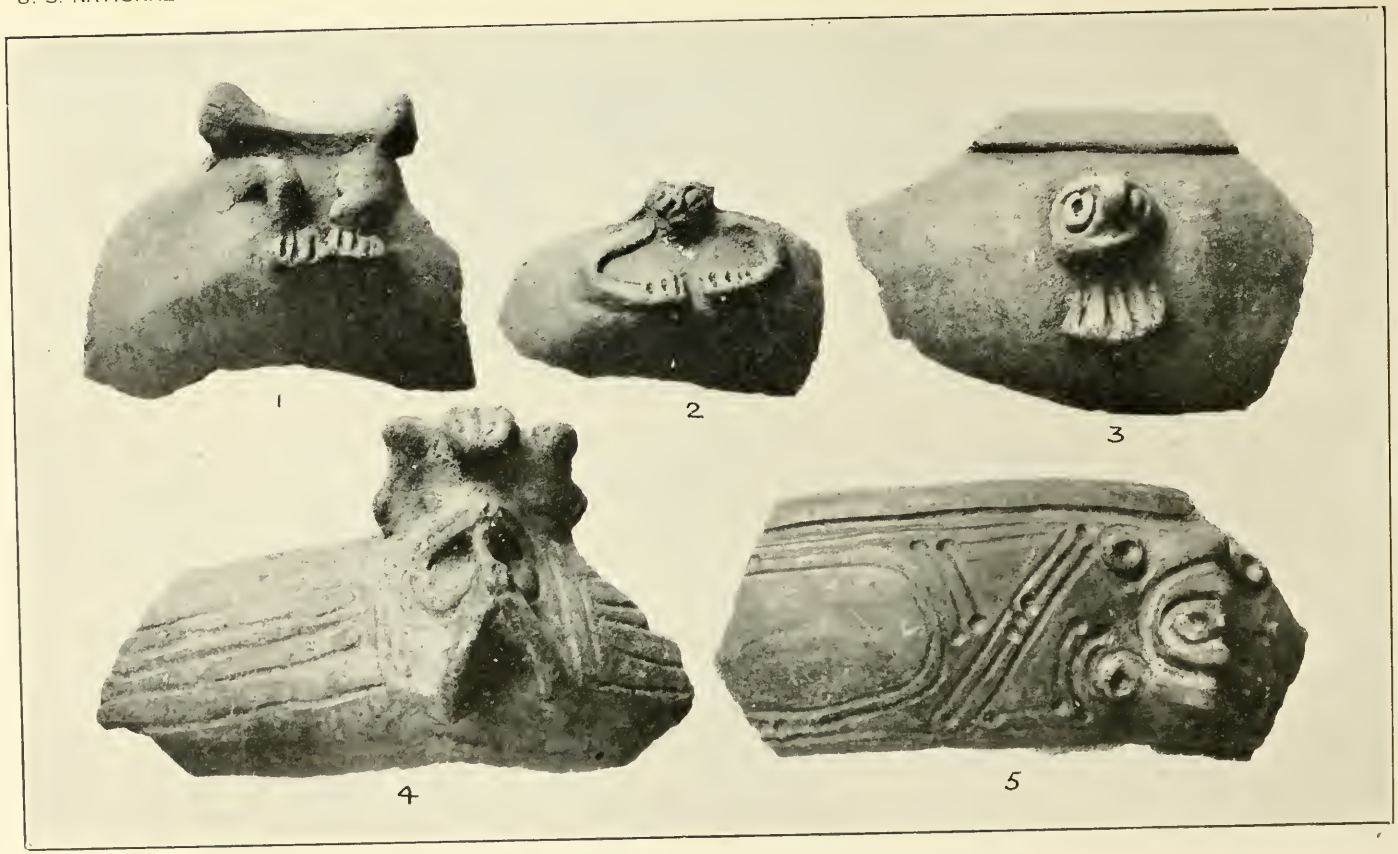
ZOOMORPHIC FIGURINES. PROVINCE OF MONTE CRISTI

ZOOMORPHIC FIGURINES. PROVINCE OF MONTE CRISTI

ZOOMORPHIC EARTHENWARE FIGURINES. PROVINCE OF MONTE CRISTI

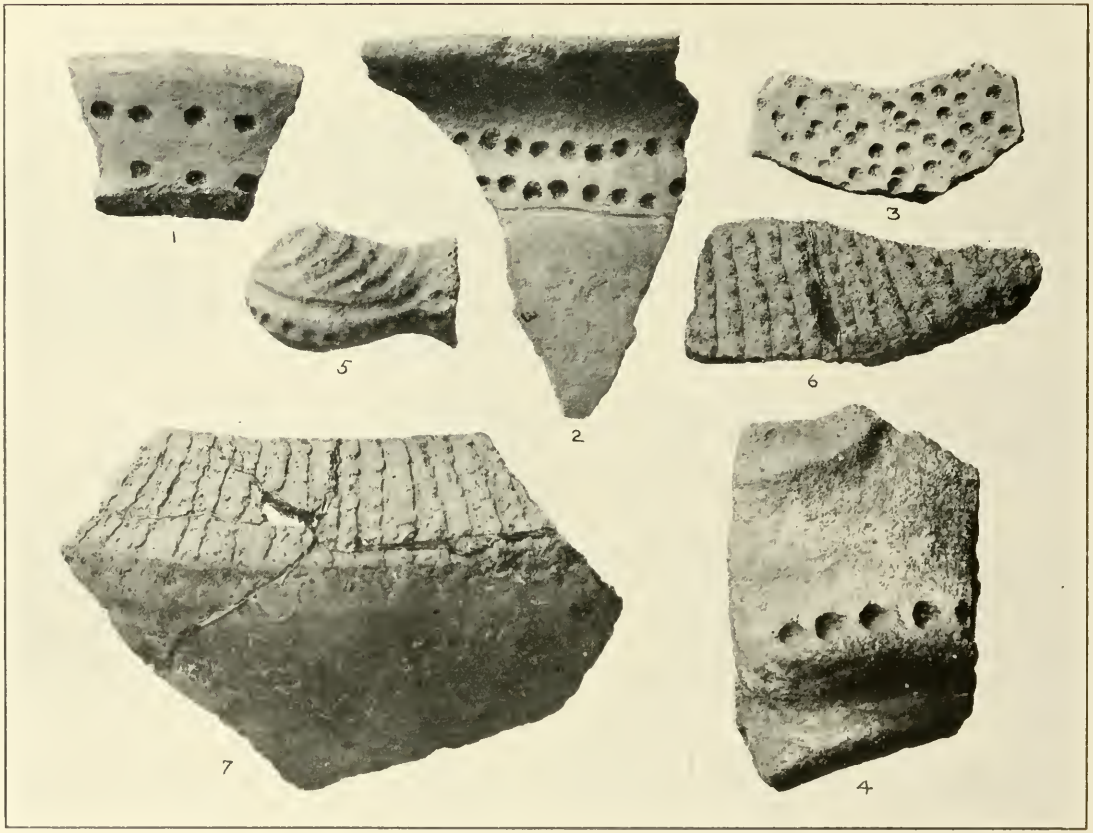


ZOOMORPHIC EARTHENWARE FIGURINES. PROVINCE OF MONTE CRISTI



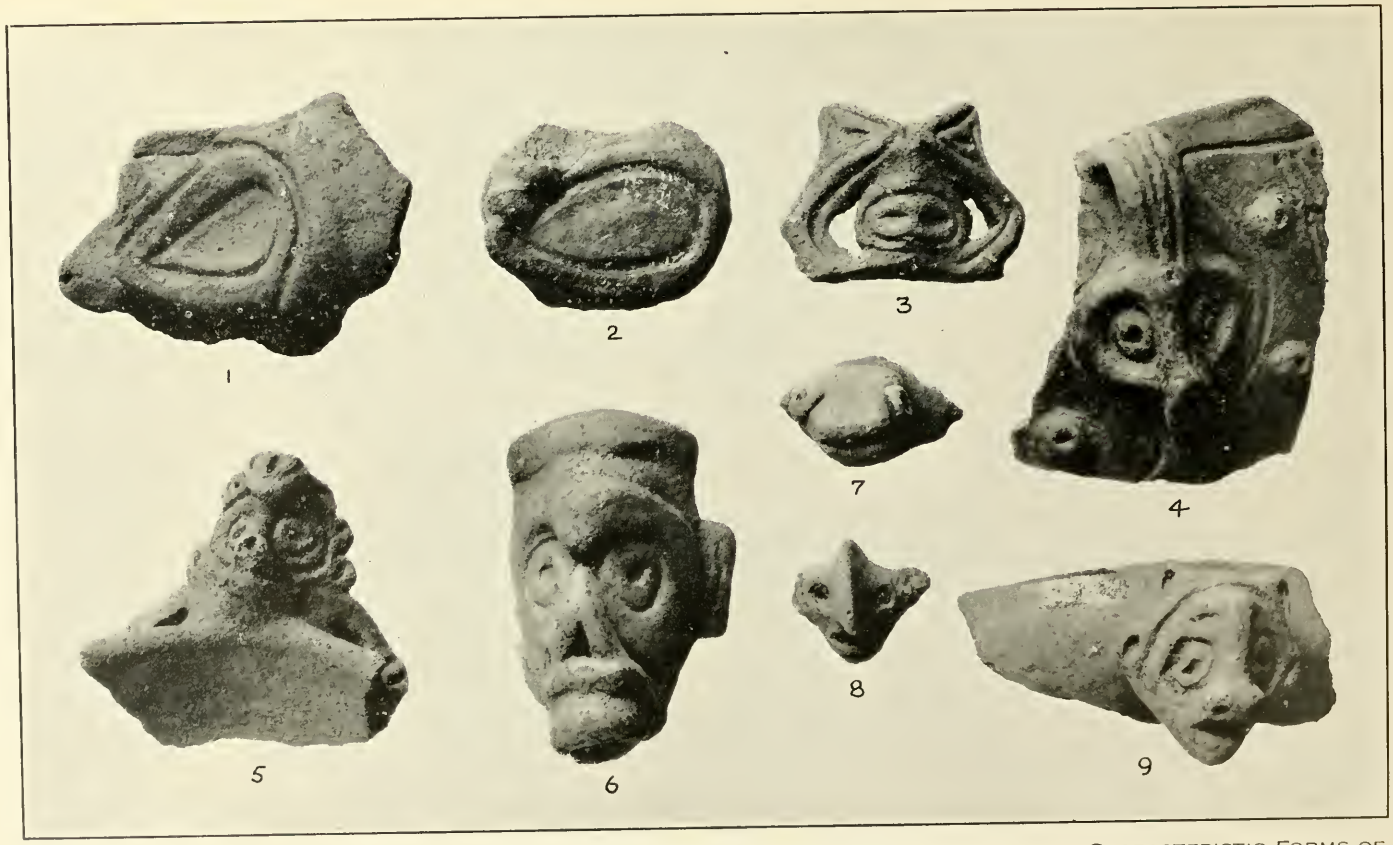
MODELED FIGURINE HEADS. PROVINCE OF SAMANA

LOOP HANDLES AND LUGS. PROVINCE OF SAMANA

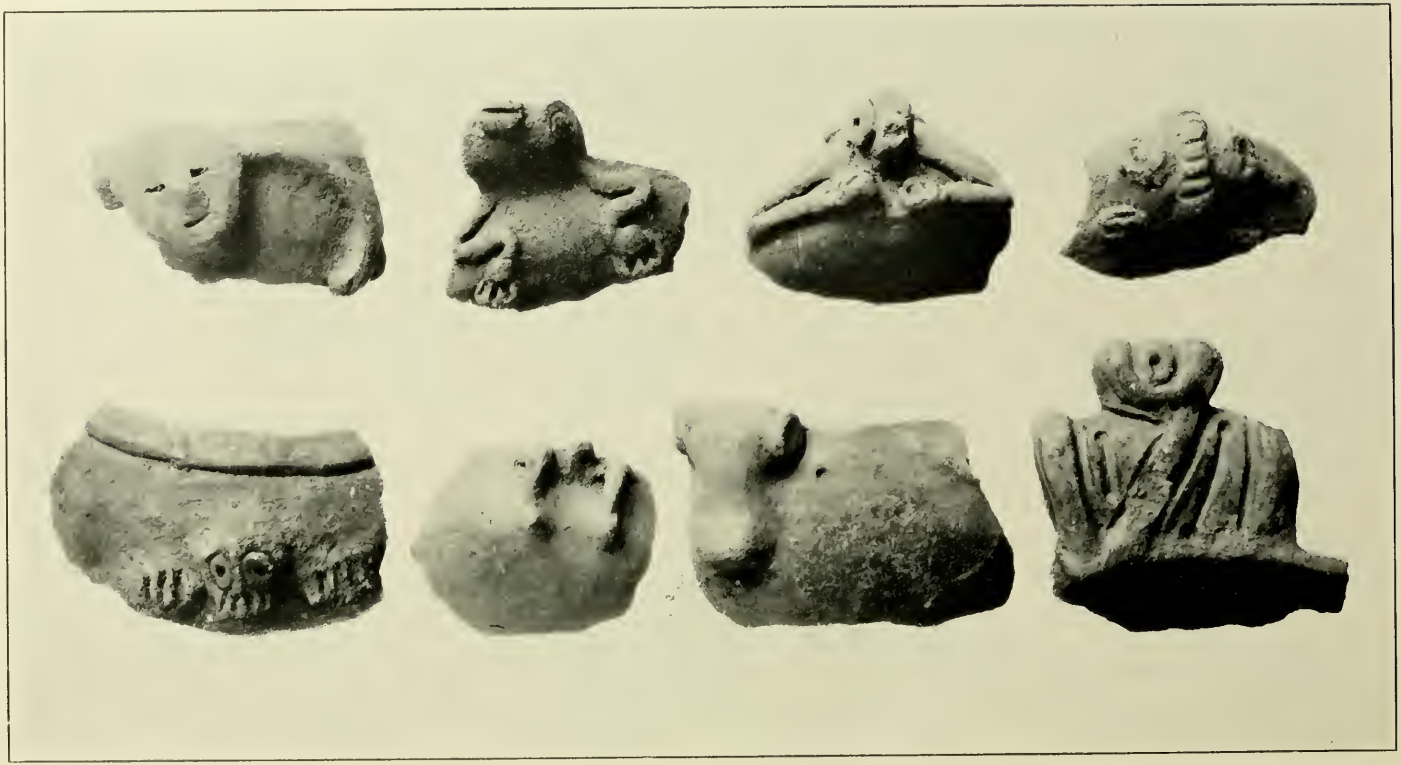


PUNCTATE AND CROSS HATCH DECORATIVE DESIGNS. SAMANA PROVINCE

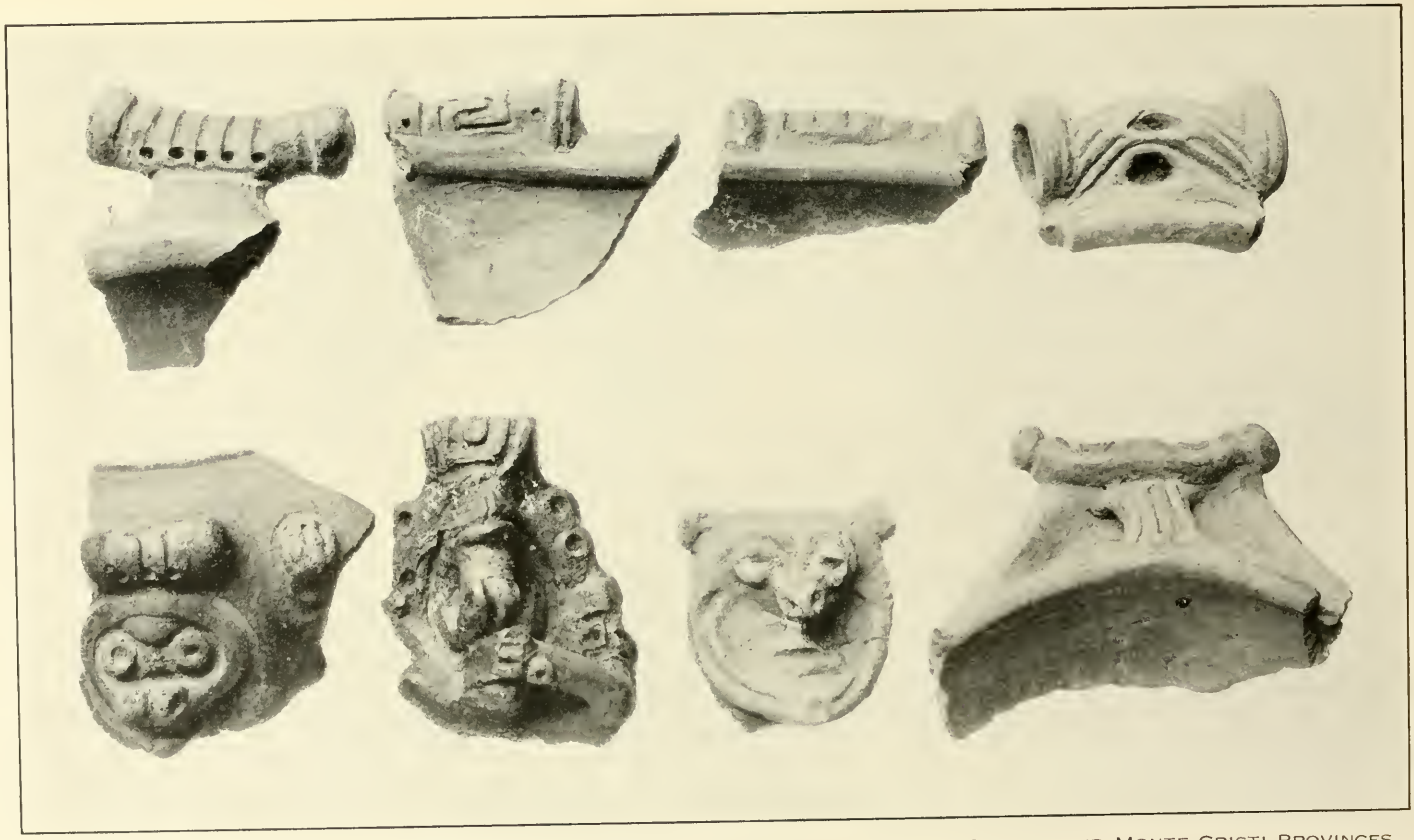
INCISED RECTILINEAR, CURVILINEAR, AND PUNCTATE DECORATIVE PATTERNS. PROVINCE OF SAMANA



DESIGN IN MODELED CLAY RESEMBLING STONE COLLARS, NUCLEATED BUTTONS AND CIRCLES, AND CHARACTERISTIC FORMS OF EYE MODELING. SAMANA PROVINCE



FROGS, AVIFORMS, RODENTS BATS. PROVINCE OF SAMANA

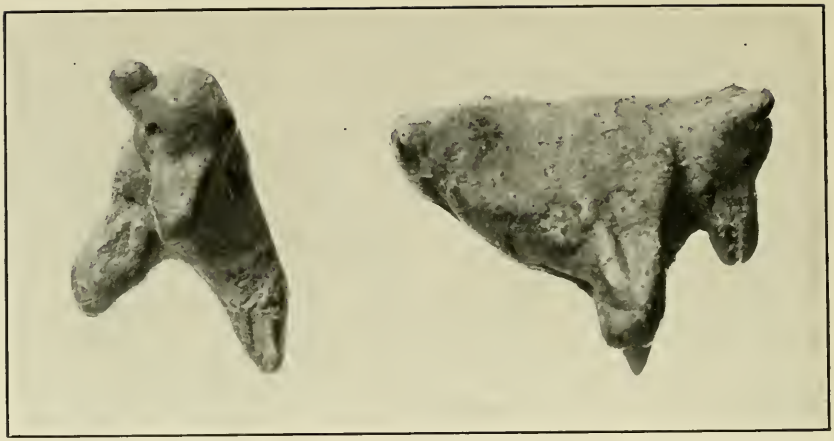


CONVENTIONALIZED FORMS OF HEADDRESS AND OF CRESTED ZOOMORPHIC FIGURINES. SAMANA AND MONTE CRISTI PROVINCES

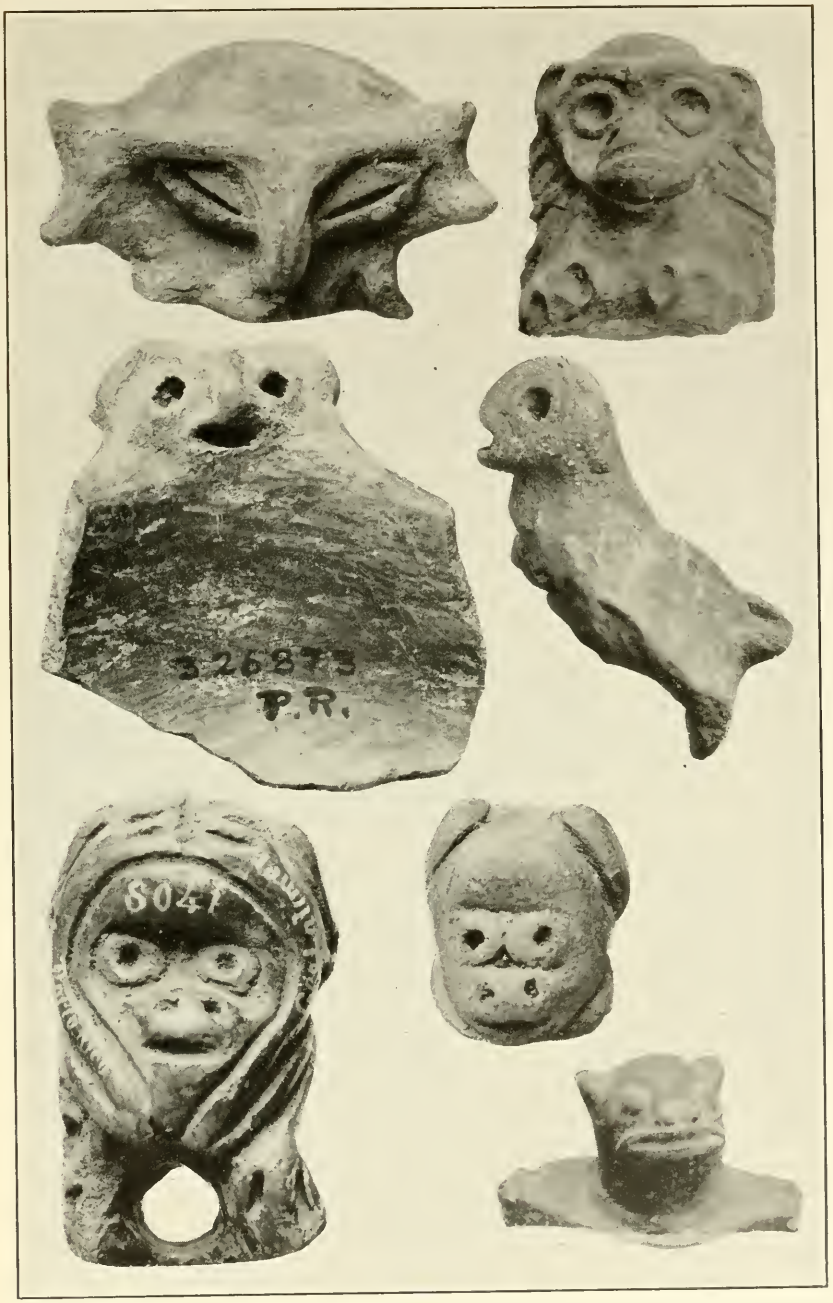
HEADDRESSES RESEMBLING TURBANS, ALSO FEATHERED FORMS. PROVINCE OF MONTE CRISTI

MAMMALIAN AND REPTILIAN FORMS OF CLAY FIGURINES. SAMANA PROVINCE

51291—31——14

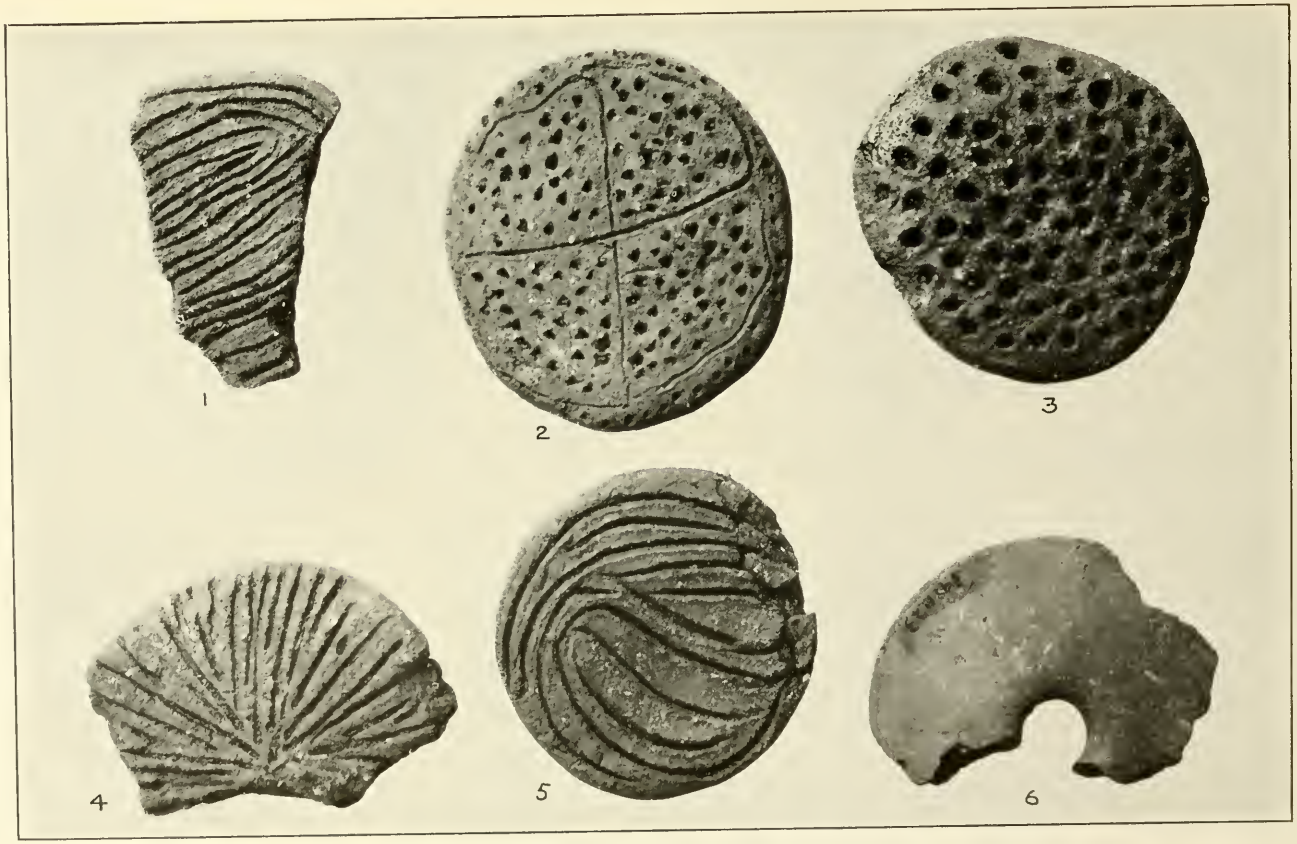


FIGURINES REPRESENTING SMALL MAMMAL FORMS AND BIRDS. CONSTANZA

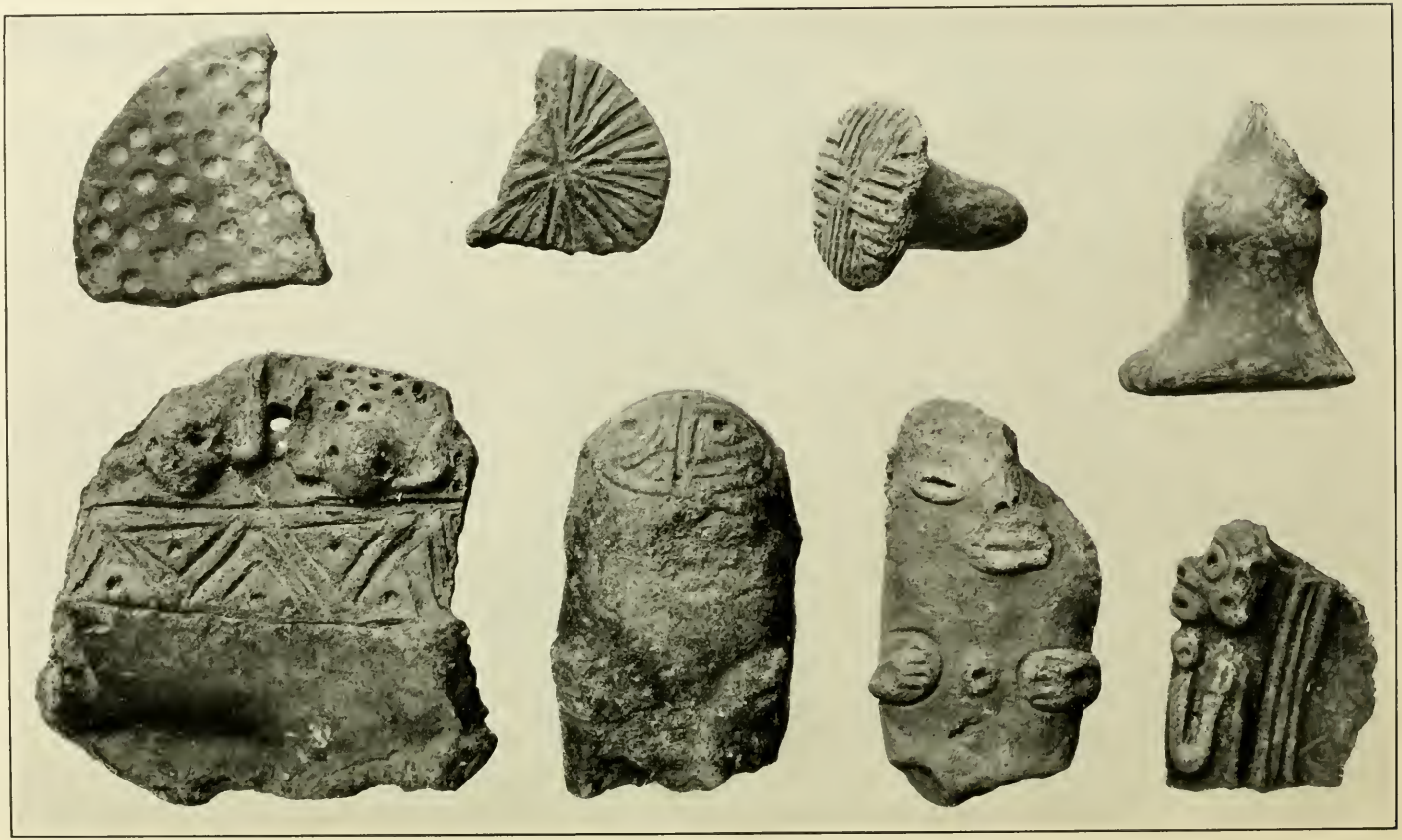


MAMMAL EFFIGY FORMS. PORTO RICO AND CONSTANZA, PROVINCE OF LA VEGA

ABOVE, EARTHENWARE SPINDLE WHORL: CENTER, EARTHENWARE CYLINDER; BELOW, FLAT DISK WITH INCISED FIGURES. MONTE CRISTI PROVINCE



FLAT EARTHENWARE DISKS. PROVINCE OF SAMANA



MISCELLANEOUS OBJECTS FROM SANTO DOMINGO AND LA VEGA PROVINCES

INCISED AND RELIEVED DECORATIVE PATTERNS. MONTE CRISTI PROVINCE

INCISED RIM PATTERNS ON EARTHENWARE PLATES. MONTE CRISTI

AVIFORM REPRESENTATIONS APPLIED TO RIMS OF EARTHENWARE VESSELS. PROVINCE OF MONTE CRISTI

ABOVE, FRAGMENT OF MORTUARY YELLOW-WARE POTTERY, JAMAICA; CENTER, BOWL RECOVERED BY GABB FROM A SAMANA MIDDEN; BELOW, BOWL FROM MIDDEN AT ANDRES SHOWING SCARIFIED CROSSHATCH PATTERN

BOAT-SHAPED YELLOW-WARE, KNOBBED MORTUARY POTTERY. KINGSTON, JAMAICA

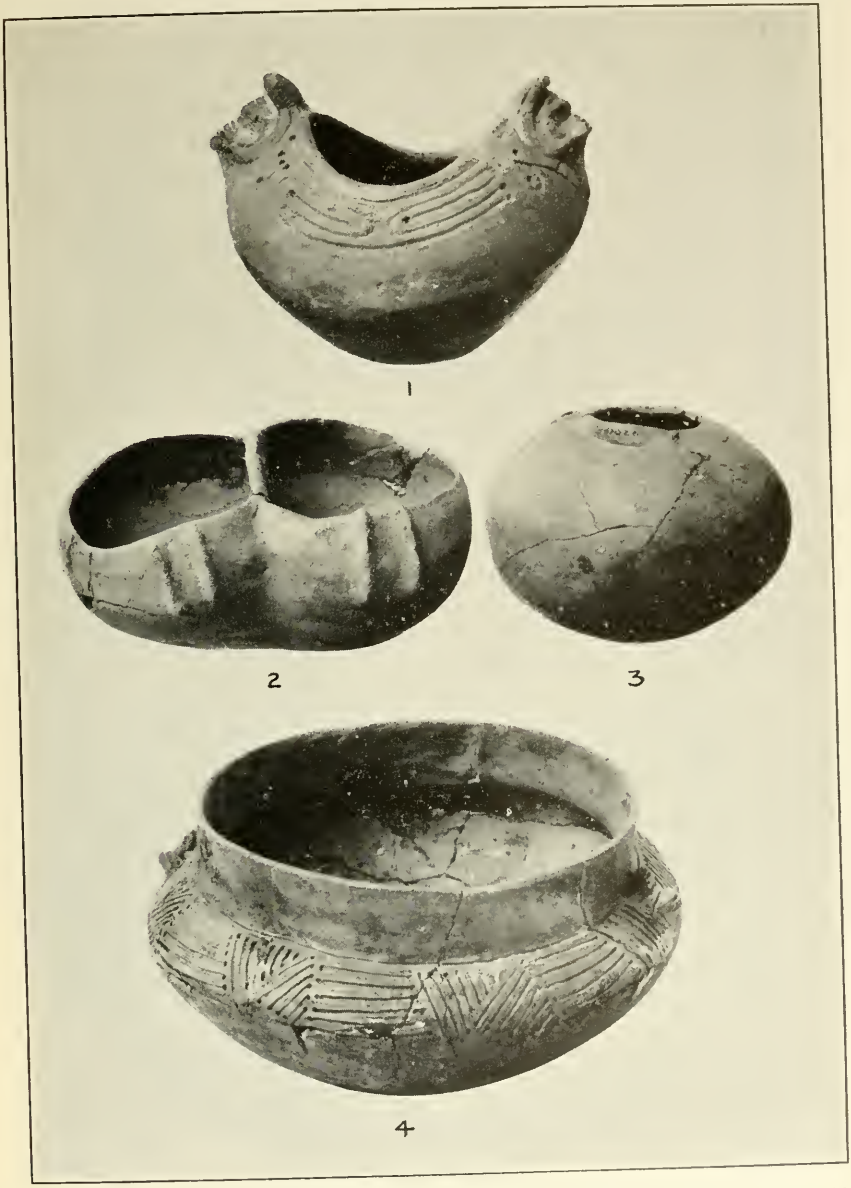
TRENCHER-SHAPED YELLOW-WARE VESSELS FROM A CAVE NEAR KINGSTON, JAMAICA, AND, BELOW, FROM CEMETERY AT ANDRES, SANTO DOMINGO

LOBED EARTHENWARE VASE FIGURED AT CENTER IS AN UNUSUAL FORM FROM CUEVA DE ROMA, NORTHERN SANTO DOMINGO

TRENCHER-SHAPED BOWLS FROM CAPE MAISE, ORIENTE PROVINCE, CUBA

ABOVE, PAINTED EARTHENWARE FROM ST. KITTS. BELOW, PAINTED, THIN-WALLED BOWL FROM GUAYUBIN, MONTE CRISTI PROVINCE

BOWLS FROM SANTO DOMINGO AND MONTE CRISTI PROVINCES



BOWLS FROM SAN JUAN MIDDEN, SAMANA PENINSULA AND (NO. 4) FROM CUEVA DEL TEMPLO, SOUTH SHORE OF SAMANA BAY

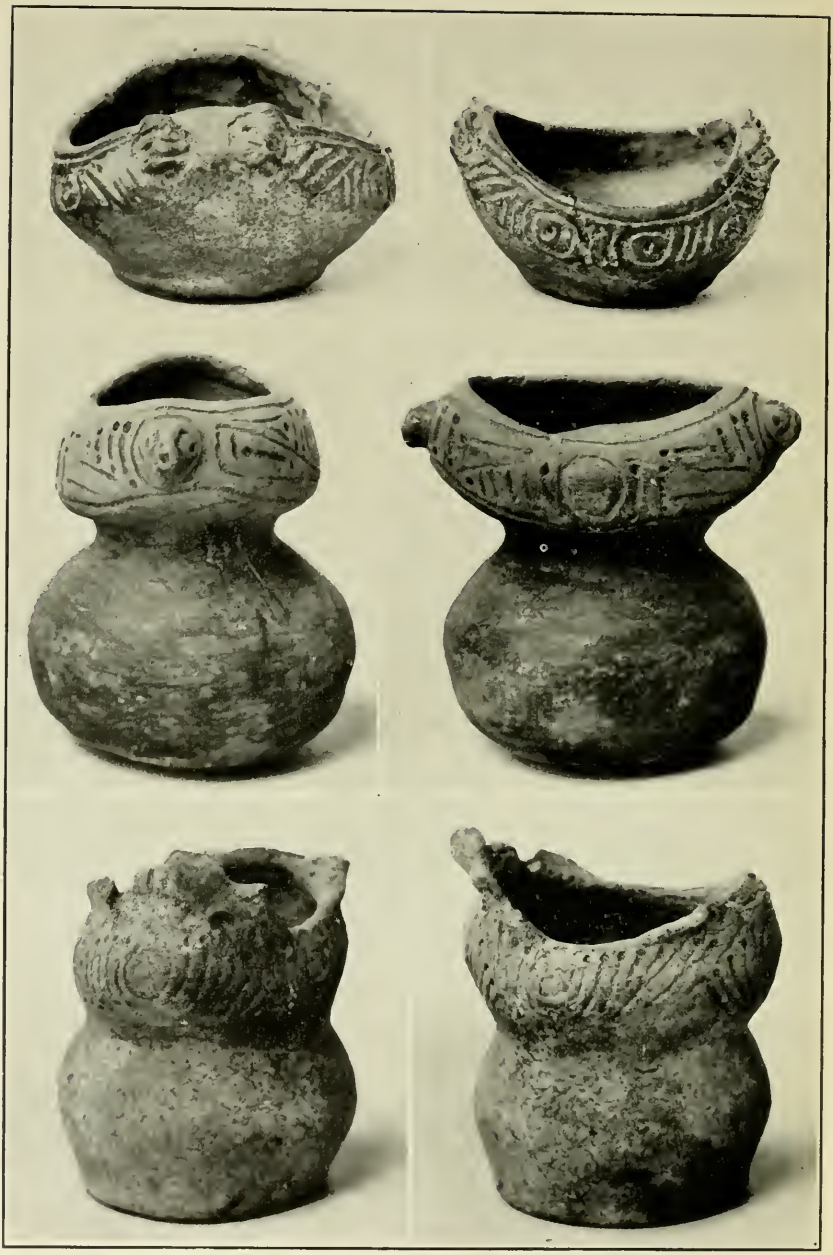
51291—31——15

ABOVE, EARTHENWARE BOWL FROM ANDRES, PROVINCE OF SANTO DOMINGO; BELOW, BOWL WITH PUNCTATE DECORATIVE DESIGN. PROVINCE OF MONTE CRISTI

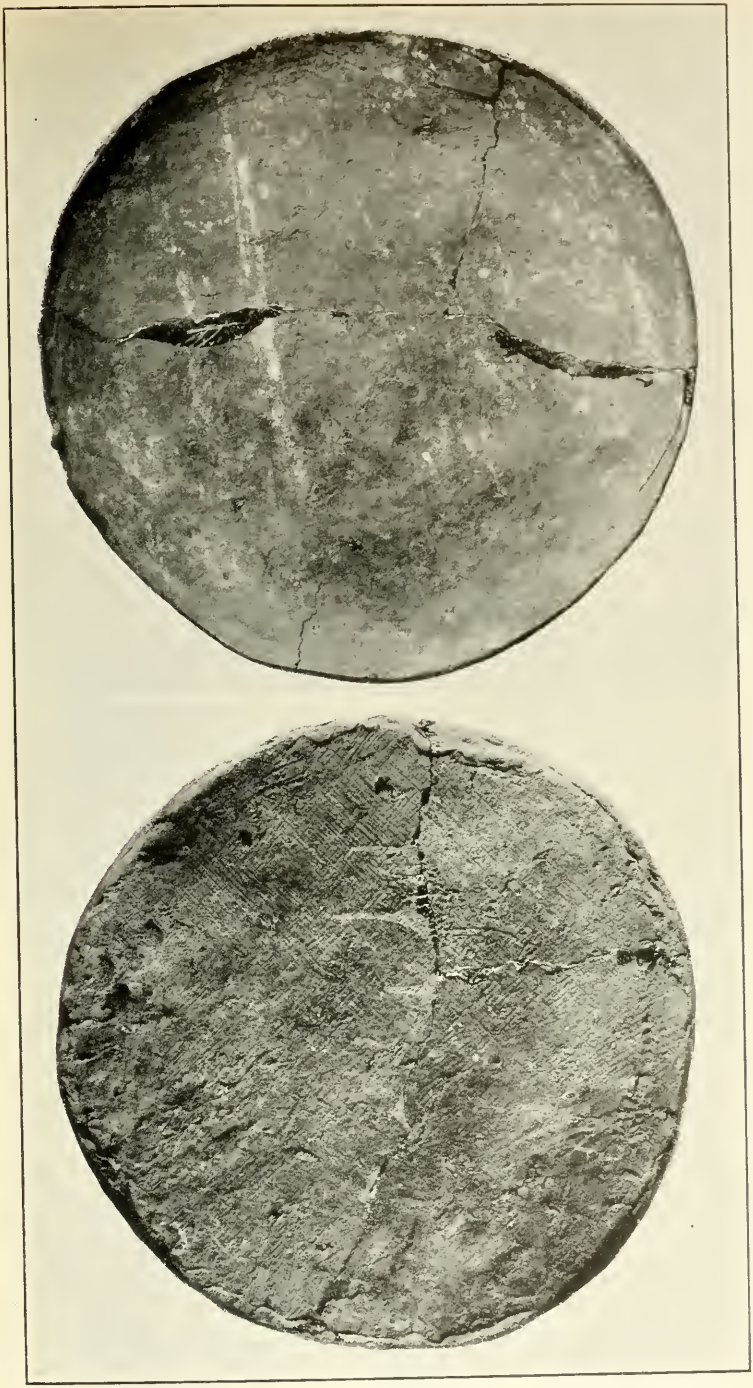
BOWLS FROM ANDRES, PROVINCE OF SANTO DOMINGO (MUCH REDUCED IN SIZE), EXCEPT LOWER CENTER, WHICH IS FROM UTUADO, PORTO RICO

BOWLS FROM ANDRES, PROVINCE OF SANTO DOMINGO

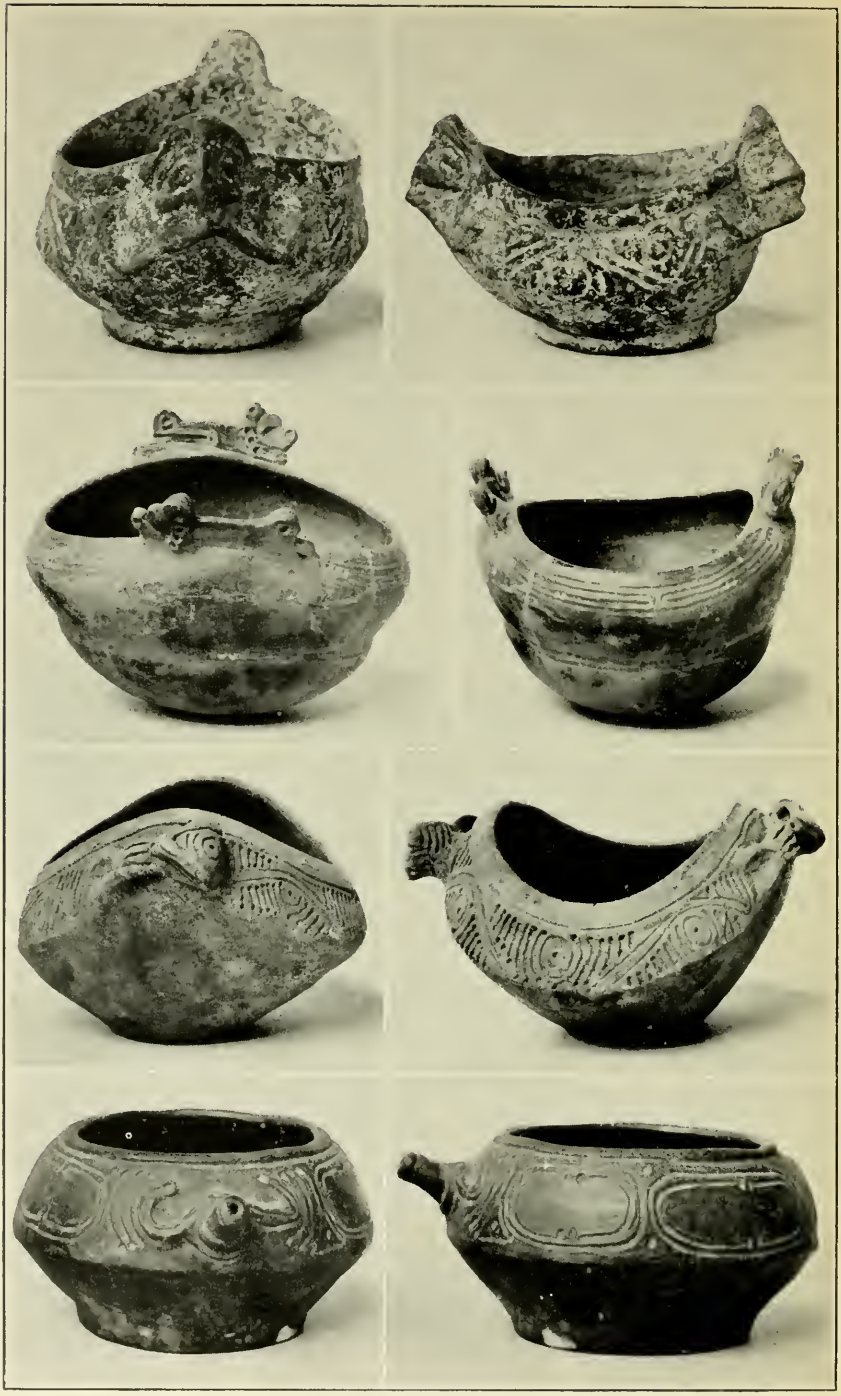
SHALLOW EARTHENWARE BOWLS. PROVINCE OF SANTO DOMINGO



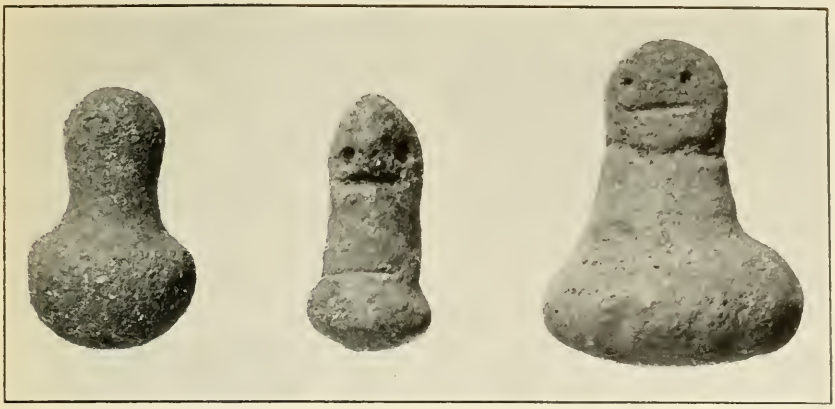
VESSELS OF UNUSUAL FORM FROM ANDRES, PROVINCE OF SANTO DOMINGO



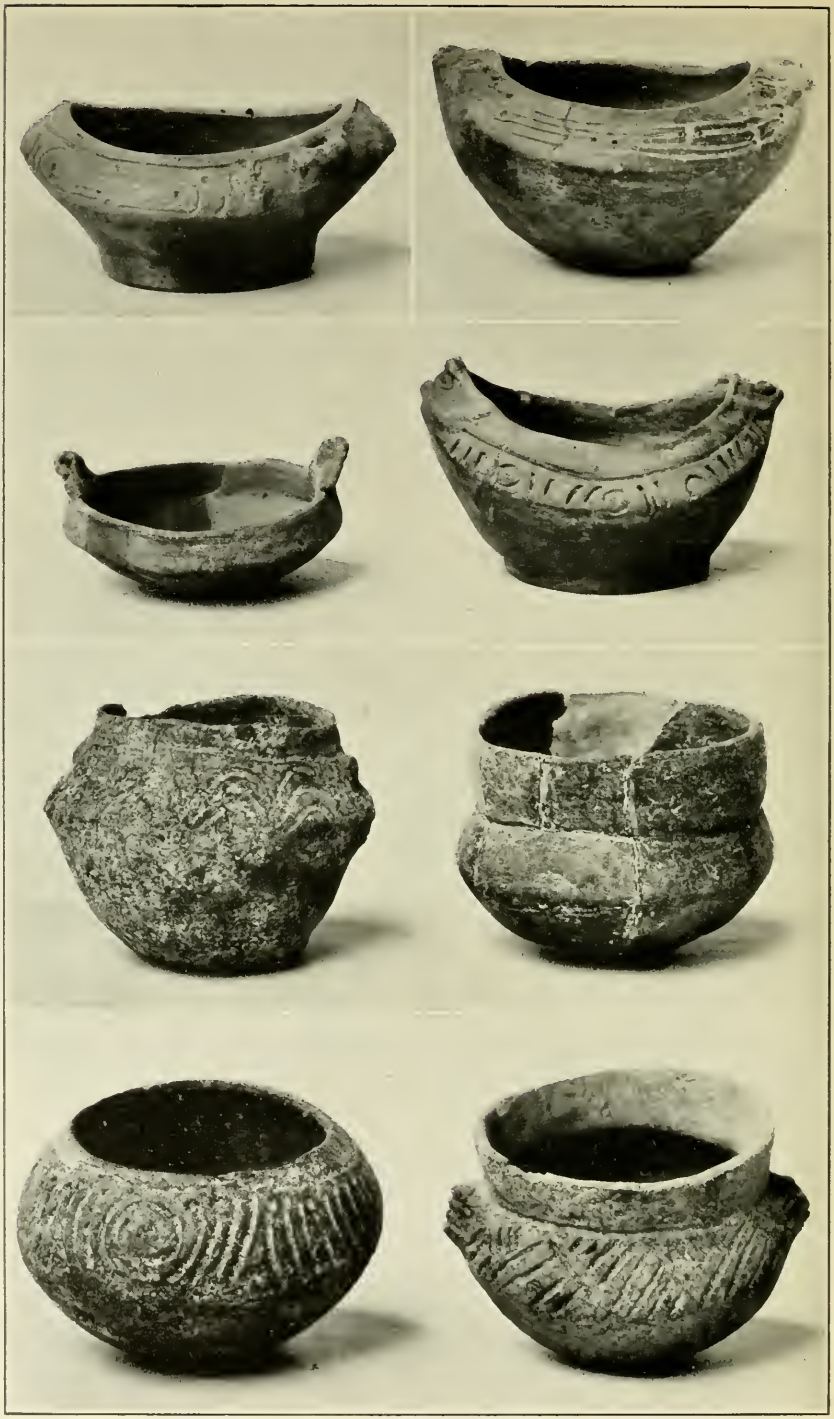
TWO VIEWS OF AN EARTHENWARE GRIDDLE OR ROASTING SLAB FROM CONSTANZA, PROVINCE OF LA VEGA. TEXTILE IMPRINT APPEARING ON BOTTOM IS UNUSUAL



FOUR EARTHENWARE BOWLS SHOWN IN PROFILE AND END VIEWS. FROM ANDRES AND LA CALETA, PROVINCE OF SANTO DOMINGO



EARTHENWARE PESTLES AND FIGURINES FROM MIDDEN NEAR CONSTANZA, PROVINCE OF LA VEGA



BOWLS FROM CONSTANZA, PROVINCE OF LA VEGA, UPPER ROW; AND FROM ANDRES, PROVINCE OF SANTO DOMINGO, LOWER ROWS

SMITHSONIAN INSTITUTION LIBRARIES
3 9088 01421 2377